A LONGITUDINAL STUDY OF THRIVING, AVERAGE, OR NON-THRIVING KINDERGARTEN CHILDREN

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Abstract

This study involved 213 children who were either in Junior Kindergarten in 1978 and Grade 1 in 1980 (69 children) or Senior Kindergarten in 1978 and Grade 2 in 1980 (144 children). Of these, 76 children had been identified by their kindergarten teachers as "thriving in terms of my goals", 80 as "making average progress", and 57 as "not yet thriving". Sixty of the kindergarten children attended regular half-day Junior or Senior Kindergarten, 82 attended alternate full-day Junior or Senior Kindergarten, and 70 attended full-day Senior Kindergarten. The major concerns of the study were the effects of different types of Kindergarten programs both in Kindergarten and Grades 1 and 2, the differences between children perceived as "thriving", "average", or "non-thriving", and the stability and predictability of those differences.

In brief, virtually no differences were found among children as a function of the type of kindergarten program attended, either in Kindergarten or two years later. Large differences were found between "thrivers" and "non-thrivers" in both Kindergarten and Grade 2 on a variety of language and academic skill measures, and on teacher-rated social skills, temperamental characteristics, and self-confidence and self-direction. Grade 1 children differed less as groups by thrive ratings (e.g., Junior Kindergarten teachers' global perceptions of thrive status were less predictive than Senior Kindergarten teachers'). However, relationships between measures, both concurrently and longitudinally, were mostly similar for both groups. In general, kindergarten measures of social and emotional characteristics were more predictive of Grade 1 and 2 academic skills than the reverse. Changes in Grade 2 thrive status were predictable from Senior Kindergarten temperament ratings. No differences were related to parental education or occupation. A major conclusion of the study is that individual differences in temperament, and related but more environmentally influenceable differences in self-confidence, self-directive strategies, and social skills, should be concerns of primary teachers along with the traditional emphasis on basic skills.

1 Introduction

The research described in this report concerns three major questions:

1. Does attending half-day, alternative full-day, or full-day Kindergarten make any difference to children's functioning in a variety of areas (health, language, academic performance, social skills, or emotional functioning) either in kindergarten (Junior or Senior) or in Grades 1 or 2?

2. What differences characterize children perceived by their kindergarten teachers to be "thriving", "average", or "non-thriving" in terms of the teachers' goals both in Kindergarten (Junior or Senior) and in Grades 1 or 2?

3. Among children from Junior Kindergarten to Grade 2, what relationships exist concurrently and longitudinally between demographic characteristics, health, language skills, academic skills, social skills, and emotional characteristics (including temperament, self-confidence, and self-direction)?

This study was originally undertaken in the spring of 1978 to examine question 1 regarding the effects of kindergarten programs. "Thriving", "average", and "non-thriving" children were selected for the study on the grounds that program differences might prove to be more salient for average or non-thriving children than for thriving children. A total of 340 children in six different school boards were included. Results of the 1978 study indicated that types of kindergarten programs made little apparent difference to children's functioning as assessed by language and academic tests; teacher ratings of social skills, temperament, self-confidence, or behavioural differences; parent ratings of emotional episodes and behavioural preferences; tester ratings of children's self-control in test-taking situations; and children's health as indexed by absences. Relevant literature on effects of kindergarten programs is discussed in the 1978 report. However, large and significant differences in most of these areas were found among children perceived by their teachers to be "thriving", "average", or "non-thriving". (For details, see Biemiller, 1978.) Major kindergarten findings will be reviewed in this report. Relevant literature concerning factors relating to thrive status is discussed in the 1978 report. Additional literature will be discussed in conjunction with the results and implications of this study.

In the spring of 1980, children for whom reasonably complete data were available in the original sample were again tested and rated.[1] A total of 213 children in five school boards were included in the 1980 sample.[2] This included 90 per cent of the target sample.

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1. The original study was undertaken on fairly short notice rather late in the school year. Most cases of missing data involved failure by teachers to complete rating scales.

2. The sixth board, Ottawa, was omitted because children were attending a bilingual program which was not considered comparable to the programs offered in the other boards.

The purposes of the follow-up study were to re-examine the effects of different types of kindergarten experience, to determine whether perceived thrive status in 1978 was related to functioning in 1980, and to examine relationships between specific measures in 1978 and 1980.

The 213 children studied were in two cohorts. One included 69 children who were in Junior Kindergarten in 1978 and Grade 1 in 1980. The other included 144 children who were in Senior Kindergarten in 1978 and Grade 2 in 1980. The number of children from each grade and program and their thrive status are shown in Table 1-1.

Table 1-1
Number of Children by Grade,
Program, and Thrive Rating

	Grade and Program							
	Junior Kindergarten Grade 1			Senior Kindergarten Grade 2				
Thrive Rating	Half-day	Alternate Full-day	Total	Half-day	Alternate Full-day	Rural Full-day	Urban Full-day	Total
Thriving	9	13	22	15	13	18	8	54
Average	10	17	27	12	18	14	9	53
Non-thriving	8	12	20	7	9	13	8	37
Total	27	42	69	34	40	45	25	144

General Characteristics of the Population Studied

The children included in this study all attended Roman Catholic separate schools in Ontario. The large majority (88 per cent) attended rural or small town schools. This population was chosen because of the original focus of the study on different types of kindergarten programs. Most alternate full-day Junior Kindergarten and full-day Senior Kindergarten programs were operated only by Roman Catholic separate school boards (RCSSBs), primarily in rural areas.[3] An important aspect of this particular sample is that the children came from an unusually homogenous background. As will be detailed in chapter 3, this population represents a relatively narrow socio-economic background, with few children coming from very poor or wealthy families, and virtually none from broken families. Within this population, economic and family structure variables have proven to play a very small role in the individual differences perceived by teachers. (Details will be given in chapter 3 and later chapters.) Thus individual differences examined in this study presumably reflect constitutional and environmental influences other than major social class factors.

3. Alternate full-day Kindergarten programs are generally operated on the basis of busing considerations in rural areas.

2 Research Design and Methods

Design

The original design was intended to include six children from ten classrooms from each of six different kindergarten programs:

1. Rural half-day (HD) Junior Kindergarten
2. Rural half-day (HD) Senior Kindergarten
3. Rural alternate full-day (AFD) Junior Kindergarten
4. Rural alternate full-day (AFD) Senior Kindergarten
5. Rural full-day (RFD) Senior Kindergarten
6. Urban full-day (UFD) Senior Kindergarten

(Full-day Junior Kindergarten programs were not included because they do not exist.)

The six children in each class were to be selected by the teacher to include two children "thriving in terms of your goals", two making "average progress in terms of your goals", and two "not as yet thriving in terms of your goals".[1] In practice, some teachers were unable or unwilling to identify two "non-thriving" children. All the HD children (10 classes) came from the York Region RCSSB. AFD children came from the Lampton County and London-Middlesex RCSSBs. RFD children attended the Bruce/Grey and Brant County RCSSBs. UFD children were from the Brant County (Brantford) and Ottawa RCSSBs.

The 213 children in the follow-up study are from all these boards except for Ottawa which was omitted because its bilingual program was not considered comparable to the other programs.

The follow-up study drew on a target sample of 230 children from the 1978 study for whom reasonably complete data were available. Of these, 218 were reported by the five participating boards to be still attending school in the board, and 213 were successfully included in the study.

No research staff or teachers involved in the 1980 study were informed of the children's 1978 thrive ratings, nor of any other 1978 data.

Sources of Data and Measures

There were four sources of data in this study: children; teachers; parents; and testers. Measures will be described briefly here. Additional detail concerning measures will be provided in chapters 4 and 5 on results.

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1. This procedure was adopted from Prescott (1973). See Biemiller (1978) for details on Prescott's findings regarding "thriving", "average", and "non-thriving" children.

Children. Children were tested for working memory capacity (1980 only), language skills, academic skills, and self-direction (1980 only). Testers were not informed of children's thrive status at the time of testing. The following specific measures were used:

1. Working Memory (1980 only). Clown Test (Case, Kurland, and Goldberg, 1982): This is a test of the number of concrete operations a child can co-ordinate simultaneously (see Case, 1978). It provides a very rough index of mental maturity. The test assesses the number of features of a clown figure the child can remember. This test was administered individually.

2. Language, 1978. CIRCUS Say and Tell Test (1978): It involves describing common objects, use of syntax, and telling a story based on a picture. This test was administered individually.

3. Language, 1980. Bankson Language Screening Test (1977): This productive language test includes four vocabulary subtests (nouns, categories, prepositions, and opposites), and four syntactic subtests (verb tenses, plurals, subject-verb agreement, and sentence completion):

   Story-telling using the same picture given in 1978 was repeated in 1980.

   These tests were administered individually.

4. Academic Skills, 1978. Two CIRCUS Tests (1977) were administered: How Much and How Many (quantitative concepts, counting one-to-one correspondence, ordination, and size comparisons); and Finding Letters and Numbers (recognizing printed letters and numbers when named by the examiner). These tests were administered in groups of three.

5. Academic Skills, 1980. Two subtests of the Metropolitan Achievement Test (1970) were administered: Mathematics Computation and Word Knowledge (relating words to pictures or other synonyms). In addition, the Grey Oral Reading Test (1967) and Biemiller Test of Reading Processes (1981) were administered: The MAT/subtests were administered in groups of up to six children. The other reading tests were administered individually.

Teachers. Teachers were asked to select the children by thrive status (1978), to rate health and tiredness (1978 only), social skills, temperament, self-confidence, and self-direction (1980 only), and to place children in the appropriate thrive group (1980 only).

1. Health and Tiredness (1978 only). Ratings were simple four-point scales.

2. Days Absent. Records of absences were obtained as an index of health.

3. Social Skills. Ratings involved largely the same items in both 1978 and 1980. These were based partly on the work of White (1973) and Wright (1978), and partly on the work of project staff (A. Biemiller, M. Rochford in 1978 and K. Main in 1980. Subscales concerned social effectiveness with peers and adults, effectiveness in adult-led group situations, and empathy. (See Appendix A-1.)

4. Temperament. A 36-item questionnaire was used.[2] Items were drawn from Thomas and Chess's (1977) scales. Nine scales are included: approach/withdrawal, adaptability, persistence, distractibility, activity level, intensity of reaction, positive mood, negative mood and threshold of response. (See Appendix A-2.)

5. Self-confidence. This scale was developed for the 1978 study and used again in 1980. It included reactions to new tasks, reactions to failure, and general self-confidence. (See Appendix A-3.)

6. Self-direction (1980 only). This scale was developed by A. Biemiller and K. Main. It included four subscales: initiating activity when free time is available, following classroom management routines, following academic routines, and following instructions on specific tasks.
(See Appendix A-4.)

7. Activities Inventory. The CIRCUS Activities Inventory (1977) was used with teachers of Junior and Senior Kindergarten children. This scale lists 15 typical kindergarten activities, and requires rating or preference (frequency of choice), participation with peers or alone, and tendency to seek adult help for each activity. A shortened version with 8 items was adapted for Grade 1 and 2 children.

8. Thrive Group (1980 only). In order to compare teachers' perceptions of "thriving" in 1980 with the original 1978 selection, teachers were asked to place children in the top, middle, or bottom third of their class with respect to "thriving in terms of your goals".

Parents. Parents were interviewed by telephone in 1978 and 1980. In both years they provided information on travel time, and activity ratings. In 1978 they were asked about evidence of tiredness. In 1980 they provided demographic information on parental occupations and education. They also gave temperament ratings.

1. Absences. Parents were asked if children were absent for any reasons other than illness (e.g., vacations, family visits, etc.).

2. Travel Time. Parents were asked when children left for school and when they returned.

3. Activities Inventory. Parents were asked to report on children's activities using the same inventory as teachers (see above). In 1980, parents were also asked about television viewing.

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2. Sixty-four items were used in 1978. The four most highly correlated items in each scale were included in the 1980 scale. Analyses in this report also use only the same 36 items for 1978 children.

4. Demographic Information (1980 only). The employment status, occupation, and education of each parent were obtained. Languages usually used in the home were obtained. In addition, the child's age and birth order and the number of siblings were obtained.

Testers. Testers were asked to complete the CIRCUS Behaviour Inventory regarding each child's behaviour in the test situation. This inventory concerns self-control, test strategy, and emotions in the test situation. Testers were not informed of children's thrive status at the time of making these ratings.

3 Background Characteristics of Children

Program Attended:

Program Differences - 1978. One of the major concerns of this study was the influence of the type of kindergarten program attended. These included half-day (HD) programs in which children attended Kindergarten for half days (morning or afternoon) five days a week; alternate full-day (AFD) programs in which children attended for full days (9:00-3:00) Monday, Wednesday, and Friday of one week and Tuesday and Thursday of the next; and full-day programs (FD) in which children attended Kindergarten for full days (9:00-3:00) five days a week. Analyses of teachers' schedules indicated that the content of HD and AFD programs was quite similar in terms of time devoted to free play, teacher-directed activities (e.g., circles, teacher-directed centres, etc.), and direct instruction. (See Table 3-1.) AFD programs devoted more time to meeting physical activities (recess, physical education), physiological needs (mostly lunch), and transition periods.

FD kindergarten programs included in this study were introduced in order to provide more direct instruction in academic skills.[1] FD programs included about the same amount of time per week for free play and physical education as the AFD programs, but substantially more time for teacher-directed and instructional activities as well as meeting physiological needs (lunch five days a week). (See Table 3-1.) Academic skills instruction focused primarily on early reading and mathematics.

Program Differences - 1980. Table 3-2 shows a rough analysis of time spent on various curriculum activities in 1980. While there are slight differences from board to board in the average numbers of hours per week teachers were spending on language arts and mathematics, and somewhat larger differences in time devoted to social studies and free activities of integrated studies, it is clear that there were much larger differences between teachers within boards than between board averages. In short, on the basis of this survey, there is little reason to expect significant differences in children's performance in language arts and mathematics (the skill areas tested) on the basis of differences in priority in Grades 1 or 2. Any differences related to program would presumably be based on differences in kindergarten programs or Grade 1 or 2 program materials rather than priorities as expressed in time.

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1. Dr. R. Dixon developed the full-day programs in both the Bruce/Grey and Brantford RCSSBs.

Table 3-1

1978 Kindergarten Class Schedules

(hours per week)

Program	Number of Classes	Settings Categories						
		Free Play	Teacher Directed	Teacher Instruction	Physical	Physiological	Transition	Total
HD Junior K	8	4.3	3.3	1.0	2.0	1.3	0.7	12.4
HD Senior K	7	4.1	4.1	0.8	1.8	1.2	0.7	12.3
Total HD	15	4.2	3.7	0.9	1.9	1.3	0.7	12.3
AFD Junior K	10	5.6	3.0	0.2	3.6	2.6	1.3	16.1
AFD Senior K	10	4.6	2.7	1.1	4.0	3.3	1.1	16.1
Total AFD	20	5.1	2.8	0.6	3.8	3.0	1.2	16.1
Rural FD	8	3.8	4.9	9.8	4.1	7.7	1.1	32.8
Urban FD	5[a]	4.8	6.2	8.3	5.2	7.2	1.2	32.8
Total FD	13	4.3	5.6	9.1	4.7	7.4	1.2	32.8

[a] Includes Brantford only.

Table 3-2

Average Hours per Week
Given to Various Curriculum Activities
by Grade and Kindergarten Programs
(Recess and Lunch Excluded)

1980 Program/1978 Kindergarten Program	Language Arts	Math	Environ-mental Studies	Free Activity Themes	Other[a.]
Grade 1/HD					
mean	9.4	3.5	1.5	2.3	6.3
range	7.3-12.5	2.5-5.4	0.0-3.8	0.0-6.7	
Grade 1/AFD					
mean	8.6	3.2	0.8	4.1	6.6
range	6.7-12.3	2.0-5.0	0.0-2.3	0.0-9.0	6.6
Grade 2/HD					
mean	9.5	3.5	5.0	1.1	5.5
range	7.9-12.9	2.5-6.3	2.0-7.1	0.0-3.8	
Grade 2/AFD					
mean	10.3	3.5	1.2	2.1	6.9
range	8.1-13.5	2.5-5.0	0.0-3.3	0.0-5.0	
Grade 2/RFD					
mean	10.0	3.9	2.6	0.2	8.0
range	8.8-12.8	2.5-5.3	1.2-4.0	0.0-2.5	
Grade 2/UFD					
mean	9.2	3.8	2.8	0.2	7.8
range	7.6-12.0	2.9-5.0	2.0-5.1	0.0-1.3	

a. No ranges computed since "other" activities include a mixture of elements ranging from opening exercises and religious education to unspecified "drill".

Children's Characteristics by Program

A number of children's background or demographic characteristics were examined. A brief summary of results by program is given below.

1. Age. There were no major differences by board. First graders averaged 6.7 years and second graders 7.8 years. No board averaged more than 0.1 years above or below the grade average. (ages as of May 15)

2. Sex. Fifty-two per cent of the JK/Grade 1 cohort were males, as were fifty-four per cent of the SK/Grade 2 cohort.

3. Family Structure. All but one child in the sample came from intact families. There were no major program differences in numbers of siblings or birth order. (The average child had two siblings and was second in birth order.)

4. Child Care Arrangements. Approximately 80 per cent of the children were cared for by their mothers, with most of the remainder cared for by siblings or relatives in their own homes. There were no major program differences.

5. Language Spoken at Home. Ninety-five per cent of the children used English as the main home language. There were no program differences.

6. Mother's Occupation. Fifty-five per cent of mothers were not working. Twenty-four per cent were working part time and 22 per cent full time. There were no program differences.

Types of employment did vary by program as shown in Table 3-3.

Table 3-3
Mother's Occupation by Program
(percentages)

	Grade 1		Grade 2			
Category	HD	AFD	HD	AFD	RFD	UFD
Not Working	58	55	41	63	62	42
Unskilled	12	10	9	8	11	33
Farming	0	5	3	3	2	4
Clerical/Technical	27	21	21	10	16	8
Business/White Collar	4	5	9	5	2	8
Professional	0	5	9	8	0	4
Unknown	0	0	9	5	7	0
N	26	42	34	40	45	24

7. Father's Occupation. All but two fathers were working full time. One was absent and one working part time. Types of employment differed by program as shown in Table 3-4.

Table 3-4
Father's Occupation by Program
(percentages)

	Grade 1		Grade 2			
Category	HD	AFD	HD	AFD	RFD	UFD
Unskilled	8	29	6	18	29	33
Farming	0	24	6	28	16	4
Clerical/Technical	32	14	24	26	31	29
Business/White Collar	60	31	56	21	22	29
Professional	0	2	9	8	2	4
N	25	42	34	39	45	24

8. Mother's Education. Twenty-six per cent of mothers had a Grade 10 education or less, 39 per cent Grade 11-13, 27 per cent applied arts college degree, and 8 per cent BA or post-BA degree. There were no significant program-related differences.

9. Father's Education. Thirty-four per cent of fathers had a Grade 10 education or less, 32 per cent Grade 11-13, 22 per cent applied arts college diploma, and 17 per cent a BA or post-BA degree. There were no significant program-related differences.

Children's Characteristics by 1978 Thrive Ratings

1. Age. There were no significant age differences associated with thrive ratings.

2. Sex. Table 3-5 shows percentages of males by thrive group and cohort. In the longitudinal sample, there were significantly more boys than girls in the "average" group but not in the "thriving" or "non-thriving" groups.

Table 3-5

Pecentage of Males by 1978 Thrive Status

1978 Thrive Status	Cohort JK-1 N	JK-1 % Male	SK-2 N	SK-2 % Male
Thriving	22	50%	54	44%
Average	27	59%	52	60%
Non-thriving	20	45%	36	58%

3. Family Structure. There being only one non-intact family, this characteristic could not be related to thrive status. There were also no significant differences related to thrive status in numbers of siblings or birth order.

4. After-school Arrangements. Sixty-four per cent of non-thrivers were cared for by their mothers compared with 81 per cent of average and thriving children. This is significant at the .10 level.

5. Language Spoken at Home. There were no significant differences related to thrive rating in the main language spoken at home. Proportionately more non-thrivers spoke only English at home (73% vs 63% of thrivers and average children). The differences is not statistically significant.

6. Mother's Occupation. Mother's occupation was not related to thrive status.

7. Father's Occupation. Father's occupation varied with thrive status for the SK/Grade 2 cohort, with proportionately more non-thrivers having fathers in unskilled occupations. However, it is important to note that all thrive groups had parents in all occupation categories. (See Table 3-6.)

Table 3-6

Father's Occupation by Thrive Status
(percentages)

	Grade 1			Grade 2		
	Thriving	Avg.	Non-Thriving	Thriving	Avg.	Non-Thriving
Unskilled	10	22	30	28	6	33
Clerical/Technical	20	19	25	20	31	33
Farm	15	20	0	13	17	14
Business/White Collar	55	30	45	33	38	17
Professional	0	4	0	6	8	3
N	20	27	20	54	52	36

8. Mother's Education. Mother's education was not significantly related to thrive status, although proportionately more Grade 2 non-thrivers (38%) had mothers with less than Grade 11 education than did average (22%) or thriving (24%) children.

9. Father's Education. Father's education was also not significantly related to thrive status, although again proportionately more Grade 2 non-thrivers (47%) had fathers with less than Grade 11 education than did average (29%) or thriving (24%) children. In short, while it is possible that there is some relationship between parental education and thrive status, low levels of parental education do not automatically produce non-thriving children nor do higher levels of parental education insure against such an outcome.

4 Effects of Thrive Status as Perceived by Kindergarten Teachers on Children's Functioning in Kindergarten and Grades 1 and 2

One of the major purposes of the 1980 follow-up study was to examine differences in children's functioning associated with their kindergarten teacher's selection of them as "thriving", "average", or "non-thriving" in terms of the teacher's goals. While it would be theoretically quite possible for such perceptions to differ in different boards, the failure to find program-related effects or interactions with thrive status (see chapter 5) indicates that this is not the case. Findings showing thrive-related differences obtained in Kindergarten essentially help to define teachers' definitions of "thriving" versus "average" and "non-thriving" children. Thrive-related differences in Grades 1 and 2 illustrate the extent to which characteristics that led to kindergarten teachers' perceptions were sufficiently stable to predict children's functioning two years later. Note that both testers and teachers rating Grade 1 and 2 children were unaware of the children's kindergarten thrive status.

Health

No statistically significant differences were found for days absent for illness. (See Table 4-1.) Although Junior Kindergarten non-thrivers appeared to be absent somewhat more often than other children, this effect was largely gone by Senior Kindergarten, and non-thrivers were absent slightly less often than other children in Grades 1 and 2. Thus health, as indexed by absence for illness, is clearly not a factor affecting thrive status.

General Intellectual Capacity

"Concrete operational working memory", a concept developed by Case (1978) and Pascual-Leone (1970), reflects maturational growth of the capicity to co-ordinate mental questions at Piaget's concrete operational stage. (Examples of such co-ordination are retaining numbers in working memory while counting or adding or classifying according to two or more criteria.) Case, Kurland, and Goldberg (1982) developed a measure of this capacity which involves having the child look at a picture of a clown-like figure with one or more coloured parts (e.g., hand, button, hat, eye, etc.). The child is then shown a second figure with no coloured parts and asked to indicate which parts were coloured on the first figure. The number of parts that can be correctly indicated reflects the child's concrete operational working memory.[1]

---

1. This measure is highly correlated with a number of quite different measure of working memory.

Table 4-1

Days Absent by Grade and Thrive Status

	Thriving	Average	Non-thriving	sig.
Junior Kindergarten				
N	21	25	18	
$\bar{x}$ (sd)	7.7(7.6)	7.2(5.8)	11.5(11.9)	ns
Senior Kindergarten				
N	50	49	30	
$\bar{x}$ (sd)	7.5(7.1)	6.2(5.7)	8.8(13.3)	ns
Grade 1				
N	21	25	19	
$\bar{x}$ (sd)	6.1(6.5)	6.5(4.9)	6.0(4.1)	ns
Grade 2				
N	53	51	34	
$\bar{x}$ (sd)	5.5(4.0)	5.1(5.3)	4.9(5.5)	ns

Table 4-2 shows working memory for thriving, average, and non-thriving children in Grades 1 and 2. Non-thrivers in Grade 2 had significantly lower scores than average or thriving children. This reflects a pattern that will be frequently repeated in this chapter. Senior Kindergarten teachers' thrive ratings are much more predictive of differences in Grade 2 than are Junior Kindergarten teachers' of thrive ratings for children in Grade 1.

Table 4-2

Working Memory by Grade and Thrive Status

	Thriving	Average	Non-thriving	sig.
Grade 1				
N	21	19	13	
$\bar{x}$	1.8	1.7	1.6	ns
Grade 2				
N	49	49	25	
$\bar{x}$	1.9	1.9	1.6	.01

The relatively small difference in working memory between Grades 1 and 2 is consistent with other findings. (See Kurland, 1981.)

The implication of the finding that working memory differs significantly across thrive groups in Grade 2 is that these non-thrivers may be slightly less intellectually or neurologically mature than average or thriving children, despite little difference in actual age.

Language

Productive language skills were assessed in 1978 using the CIRCUS Say and Tell Test and in 1980 using the Bankson Language Test.

Vocabulary. No direct vocabulary test was given in 1978. An assessment of available descriptive language was given by having children describe two pennies and scoring the number of things they said about them. Senior Kindergarten children had a statistically significant difference on this test by thrive status, but the difference was not large. (See Table 4-3.)

Table 4-3
Circus Say and Tell Pennies Test
by Grade and Thrive Status

	Thriving	Average	Non-thriving	sig.
Junior Kindergarten				
N	22	27	20	
$\bar{x}$ (sd)	3.0(1.3)	2.9(1.1)	2.6(1.3)	ns
Senior Kindergarten				
N	54	53	37	
$\bar{x}$ (sd)	4.1(1.4)	4.0(1.4)	3.4(1.5)	.01

The 1980 Bankson Test had four subscales dealing with vocabulary. Grade 1 and 2 children showed consistent statistically significant but relatively small differences on the four Bankson vocabulary scales. The only measure yielding a fairly substantial difference in both grades was "opposites", in which the child was to give the opposite of a given word. (See Table 4-4.)

Grammar. The 1978 CIRCUS Say and Tell Test included an assessment of "functional language" involving the child's abilities to pluralize and use tense, prepositions, possessives, and imperatives. Both Junior and Senior Kindergarten children differed on this scale by thrive status. (See Table 4-5.)

The 1980 Bankson Test had four subscales dealing with functional language or grammar. Grade 1 and 2 children differed slightly more by thrive status on these measures than on the vocabulary measures. The largest differences were in the correct use of plurals. (See Table 4-6.) Twin studies suggest that grammatical development has a substantial constitutional component (Munsinger and Douglass, 1976).

Table 4-4
Bankson Vocabulary Scales
by Grade and Thrive Status
(standard deviations in parentheses)[a]

	Thriving	Average	Non-thriving	sig
Grade 1				
N	22	27	20	
Nouns	8.9(0.3)	8.7(0.6)	8.3(0.9)	.01
Categories	7.1(0.8)	7.1(0.5)	6.7(0.7)	.07
Prepositions	8.1(1.0)	7.8(1.1)	6.8(1.3)	.03
Opposites	7.1(0.9)	6.9(1.4)	5.4(1.9)	.01
$\bar{x}$	7.8(0.4)	7.6(0.6)	6.8(0.7)	.01
Grade 2				
N	54	53	37	
Nouns	8.9(0.3)	8.8(0.5)	8.5(0.8)	.02
Categories	7.5(0.7)	7.4(0.6)	7.0)0.6)	.01
Prepositions	8.3(0.6)	8.1(0.9)	7.6(1.4)	.01
Opposites	7.8(0.9)	7.6(1.0)	6.7(1.6)	.01
$\bar{x}$	8.1(1.5)	7.9(0.4)	7.5(0.6)	.01

[a] Nine items per subscale.

Table 4-5
CIRCUS Functional Language
by Grade and Thrive Status

	Thriving	Average	Non-Thriving	sig.
Junior Kindergarten				
N	22	27	20	
$\bar{x}$ (sd)	54.3(6.8)	49.8(7.7)	44.4(10.9)	.01
Senior Kindergarten				
N	54	53	37	
$\bar{x}$ (sd)	59.9(6.9)	57.9(8.0)	51.1(8.9)	.01

Table 4-6
Bankson Functional Language (Grammar) Scales
by Grade and Thrive Status
(standard deviations in parentheses)

	Triving	Average	Non-Thriving	sig.
Grade 1				
N	22	27	20	
Verb Tense	8.5(0.7)	7.8(1.4)	7.1(2.2)	.01
Plurals	7.2(1.4)	6.4(1.2)	6.0(1.3)	.01
Subj.-Verb Agreement	8.7(0.6)	8.7(0.6)	8.2(0.9)	.04
Sentence Completion	8.3(0.8)	7.9(1.3)	7.1(1.6)	.01
	8.2(0.5)	7.7(0.8)	7.1(0.8)	.01
Grade 2				
N	54	53	37	
Verb Tense	8.6(1.1)	8.3(1.1)	7.7(1.7)	.01
Plurals	8.4(0.8)	7.8(1.1)	6.7(1.4)	.01
Subj.-Verb Agreement	8.8(0.4)	8.8(0.5)	8.4(0.9)	.01
Sentence Completion	8.5(0.7)	8.7(0.6)	7.5(1.1)	.01
	8.6(0.5)	8.4(0.5)	7.6(0.8)	.01

Narration. In both 1978 and 1980, children were shown a complex picture of a circus and asked to tell a story to go with the picture. (There was a 3-minute time limit.) The total number of words used in the story was recorded. Thrive status was not significantly related to total words used in Junior or Senior Kindergarten or Grade 2. While non-thrivers in each grade used the lowest mean total number of words, average children used the highest mean total number of words in three of the four grades. (See Table 4-7)

Table 4-7
Narrative Words by Grade and Thrive Status

	Thriving	Average	Non-Thriving	sig.
JK				
N	22	27	20	
$\bar{x}$ (sd)	58.6(41.3)	69.1(35.6)	47.3(34.6)	ns
SK				
N	54	53	37	
$\bar{x}$ (sd)	79.0(53.5)	72.1(43.0)	70.3(42.0)	ns
Grade 1				
N	22	26	20	
$\bar{x}$ (sd)	74.4(48.1)	105.2(59.5)	64.7(46.1)	.03
Grade 2				
N	52	52	37	
$\bar{x}$ (sd)	107.2(51.1)	126.9(70.3)	91.9(71.5)	ns

Although some, mostly small, thrive-related effects were found for measures of productive languages, we shall see in chapters 7 and 8 that these differences are not highly correlated with either differences in academic performance or social and emotional development.

Academic Skills

Mathematics Skills. In 1978, children were assessed for written number recognition (pointing to correct numbers when numbers were said by the examiner) and for quantitative knowledge (CIRCUS How Much and How Many Test, involving counting, one-to-one correspondence, ordination, comparison, and quantitative language). Fairly substantial thrive-related differences were found for both tests in Junior and Senior Kindergarten (See Table 4-8.)

Table 4-8
CIRCUS How Much and How Many
and Number Recognition
by Grade and Thrive Status
(standard deviation in parentheses)

	Thriving	Average	Non-Thriving	sig.
Junior Kindergarten				
N	22	27	20	
Number Recognition[a]	3.4(0.8)	3.1(1.2)	2.6(1.1)	.05
How Much & How Many[b]	31.8(3.2)	28.0(4.9)	24.1(6.7)	.01
Senior Kindergarten				
N	54	53	37	
Number Recognition[a]	4.3(0.8)	3.9(0.8)	3.4(0.8)	.01
How Much & How Many[b]	37.5(2.1)	36.0(3.7)	31.4(4.8)	.01

a. Maximum possible score = 5.

b. Maximum possible score = 42.

In 1980, the MAT Mathematics Computation Primary I and Primary II Tests were administered. Quite substantial thrive-related differences were found for both Grades 1 and 2, although the spread was wider for Grade 2 (74% vs 41%) than for Grade 1 (68% vs 49%). (See Table 4-9.)

Table 4-9
(MAT) Mathematics Computation
by Grade and Thrive Status
(standard deviations in parentheses)

	Thriving	Average	Non-thriving	sig.
Grade 1				
N	22	27	19	
Per Cent Correct[a]	68% (19%)	58% (21%)	49% (17%)	.01
Grade 2				
N	53	51	37	
Per Cent Correct	74% (20%)	61% (15%)	41% (14%)	.01
Standard Score	61.4(9.6)	54.8(7.3)	45.1(9.2)	.01
Grade Equivalent	3.3	2.8	2.0	

a. Only the computation items yielding an incomplete score were given. Hence no standard scores or grade equivalents can be computed.

Reading. In 1978, a CIRCUS test of letter recognition was given. Non-thrivers recognized fewer letters, especially in Junior Kindergarten. (See Table 4-10.)

Table 4-10
CIRCUS Letter Recognition
by Grade and Thrive Status[a]

	Thriving	Average	Non-thriving	sig.
Junior Kindergarten				
N	22	27	20	
$\bar{x}$ (sd)	13.4(2.6)	10.7(3.2)	8.5(4.1)	.01
Senior Kindergarten				
N	54	53	37	
$\bar{x}$ (sd)	14.8(0.6)	14.4(1.1)	12.1(3.5)	.01

a. Maximum possible score = 15.

In 1980, the MAT Word Knowledge Test was given. Items on this test involve selecting one of four words which best corresponds to a picture or another word. It thus is related to both decoding skill and vocabulary. There were large thrive-related differences on this measure, with the usual larger effect in Grade 2. (See Table 4-11.)

Table 4-11
MAT Word Knowledge Scores
by Grade and Thrive Status
(standard deviations in parentheses)

	Thriving	Average	Non-thriving	sig.
Grade 1				
N	22	27	20	
Standard Score	49.0(8.8)	43.4(9.8)	38.6(6.9)	.01
Grade Equivalent	2.3	1.9	1.7	
Grade 2				
N	53	53	37	
Standard Score	66.2(8.7)	59.4(9.6)	48.1(8.0)	.01
Grade Equivalent	3.9	3.2	2.2	

The Biemiller Test of Reading Processes was also administered. This test assesses the time required to read letters, primary words out of context, and the same words in context. Letter times are an index of general reading readiness, while the other measures reflect general reading ability (story time) and use of orthographic structure (differences between letter and word times). Table 4-12 shows the results. Only letter times are shown for first graders as many of the children were unable to read the word and text passages with sufficient accuracy to assess reading times.

Table 4-12
Mean Seconds Per Letter,
Word, and Word in Context
by Grade and Thrive Status
(standard deviations in parentheses)

	Thriving	Average	Non-thriving	sig.
Grade 1				
N	22	27	19	
Letters	0.86(.22)	1.03(.34)	1.11(.40)	.05
Grade 2				
N	54	53	37	
Letters	0.65(.13)	0.71(.14)	0.90(.22)	.01
N	54	51	27	
Words	0.72(.19)	0.84(.20)	1.11(.51)	.01
N	54	52	33	
Words in Context	0.43(.11)	0.54(.16)	0.83(.30)	.01

Results indicate that Grade 1 and 2 non-thrivers and average children differ from thrivers in general reading readiness (indexed by letter times). This again indicates possible differences in neurological maturity, as was suggested in the section on intellectual capacity.[2]

Grade 2 average and non-thriving children appear to use orthographic structure less effectively to facilitate word recognition than do thriving children. This is indicated by the fact that the difference between their letter and word times is greater (0.13 seconds for average and 0.21 seconds for non-thriving children) than is the difference for thriving children (0.07 seconds).[3]

Social Abilities

Social abilities were assessed in all grades by means of teacher ratings of the frequency with which children demonstrated effectiveness in four areas: (1) dealing with peers; (2) dealing with adults; (3) functioning in adult-led group situations; and (4) demonstrating empathy. Substantial, statistically significant thrive-related differences were found in all grades except Grade 1. (See Table 4-13.)

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2. It is interesting to consider what cues Junior and Senior Kindergarten teachers are using that predict speed of letter reading two years later!

3. By third or fourth grade, able readers read these words as quickly as letters.

Table 4-13
Teacher Ratings of Mean Social Abilities
by Grade and Thrive Status
(standard deviations in parentheses)

	Thriving	Average	Non-thriving	sig.
Junior Kindergarten				
N	16	22	18	
Peer Skills	4.1(0.8)	3.9(0.8)	2.9(0.9)	.01
Adult Skills	4.1(0.4)	4.0(0.6)	3.3(0.8)	.01
Adult-led Group Skills	4.5(0.5)	4.3(0.6)	3.2(0.8)	.01
Empathy	3.9(0.8)	3.5(0.9)	2.8(0.6)	.01
Senior Kindergarten				
N	48	47	32	
Peer Skills	4.0(0.7)	3.5(1.0)	2.9(1.0)	.01
Adult Skills	3.9(0.7)	3.7(0.9)	3.4(1.1)	.06
Adult-led Group Skills	4.6(0.5)	4.2(0.6)	3.6(0.7)	.01
Empathy	4.3(0.7)	3.6(0.9)	3.0(1.0)	.01
Grade 1				
N	22	26	16	
Peer Skills	3.7(1.0)	3.7(0.9)	3.3(0.9)	ns
Adult Skills	3.9(0.9)	4.1(0.8)	4.3(0.9)	ns
Adult-led Group Skills	4.4(0.6)	4.3(0.7)	4.1(0.6)	ns
Empathy	3.6(1.1)	3.9(0.9)	3.6(0.9)	ns
Grade 2				
N	49	47	34	
Peer Skills	4.1(0.6)	3.7(0.9)	3.0(1.0)	.01
Adult Skills	4.1(0.8)	3.9(0.9)	3.3(1.1)	.01
Adult-led Group Skills	4.7(0.4)	4.3(0.6)	3.3(0.8)	.01
Empathy	4.1(0.6)	3.8(0.8)	2.8(0.9)	.01

In terms of actual ratings, the meaning of these scores can be illustrated by item responses for the Grade 2 children. (See Table 4-14.) On average, 80 per cent of the children perceived as "thriving" in Kindergarten were reported to demonstrate effective peer and adult skills at least "once a day". On average, only 40 per cent of children perceived as "non-thriving" in kindergarten were reported to demonstrate these skills daily in Grade 2. Differences were more marked for adult-led group skills and largest of all for empathy.

Table 4-14
Percentage of Children Rated Demonstrating
Specific Social Skills "Daily" or "Fairly Often"
in Grade 2 by Thrive Status

	Thriving	Average	Non-Thriving
	"Once a day or more often"		
Peer Skills			
Leads peers	63	46	14
Gains peer attention pleasantly	96	90	57
Expresses affection to peers	82 / 80.3	67 / 67.7	40 / 37.0
Adult Skills			
Gains adult attention pleasantly	88	80	60
Expresses affection to adults	69 / 80	63 / 69	43 / 43
	"Fairly often or often"		
Adult-led Group Skills			
A. Participates	98	88	43
B. Answers questions	100	90	51
C. Listens to other children	96	82	51
D. Addresses group	97 / 97	72 / 83	37 / 46
Empathy			
Aware of impact on others	73	65	18
Concerned with others' feelings	86 / 80	68 / 67	29 / 25

Temperament

The term "temperament" as used in this study refers to individual differences in the attentional and arousal systems of the brain. These individual differences as outlined by Thomas and Chess (1977) result in different levels of persistance, distractibility, activity, and intensity in children. In addition, there are temperamental differences in adaptability to new situations and, more specifically, in willingness to approach or try new situations or tasks. Temperamental differences also include tendencies to display positive and negative moods. Finally, there are differences in the level or threshold of stimulation needed to make a response.

Table 4-15 shows mean ratings on these temperament scales by kindergarten thrive status. (Note, rating scales for temperament range from 1 to 7.) The usual pattern of reduced thrive status differences in Grade 1 was repeated.

Table 4-15
Kindergarten Temperament Scores
by Grade and Thrive Status
(standard deviations in parentheses)

	Thriving	Average	Non-thriving	sig.
Junior Kindergarten				
N	18	22	18	
Approach/Withdrawal	5.6(1.5)	4.6(1.5)	3.4(1.6)	.01
Positive Mood	6.4(0.6)	5.9(0.8)	5.1(0.9)	.01
Adaptability	6.0(1.3)	5.5(1.2)	4.0(1.6)	.01
Persistence	4.9(0.8)	4.5(1.0)	3.6(1.1)	.01
Distractability	2.8(1.1)	3.5(1.1)	5.1(1.3)	.01
Activity Level	2.1(1.1)	2.4(1.1)	4.2(1.5)	.01
Negative Mood	2.3(1.2)	2.6(0.8)	3.1(1.4)	.01
Intensity	4.3(1.4)	4.3(1.2)	3.6(1.6)	ns
Threshold	2.6(1.3)	2.9(1.4)	2.6(1.3)	ns
Senior Kindergarten				
N	48	46	29	
Approach/Withdrawal	5.7(1.0)	4.7(1.3)	3.4(1.6)	.01
Positive Mood	6.3(0.7)	6.0(0.8)	5.1(1.1)	.01
Adaptability	6.3(0.7)	5.5(1.0)	4.2(1.6)	.01
Persistence	5.1(0.4)	4.3(0.9)	2.9(1.1)	.01
Distractibility	2.4(1.0)	3.7(1.4)	5.5(1.4)	.01
Activity Level	2.1(1.1)	2.8(1.5)	4.5(1.6)	.01
Negative Mood	2.7(1.3)	2.8(1.2)	3.5(1.6)	.02
Intensity	4.1(1.2)	4.0(1.2)	3.8(1.5)	ns
Threshold	3.1(1.2)	2.9(1.2)	2.5(1.2)	ns

Table 4-15 (continued)
Grade 1 and 2 Temperament Scores
by Thrive Status

	Thriving	Average	Non-thriving	sig.
Grade 1				
N	22	25	17	
Approach/Withdrawal	5.0(1.5)	4.6(1.3)	3.7(1.4)	.05
Positive Mood	5.7(1.1)	5.5(1.1)	5.4(0.6)	ns
Adaptability	5.8(1.1)	5.4(1.1)	4.5(1.0)	.01
Persistence	5.1(1.3)	4.9(1.0)	4.5(1.0)	ns
Distractibility	4.0(0.9)	4.0(1.2)	4.5(1.0)	ns
Activity Level	2.3(1.3)	2.8(1.4)	3.3(1.4)	ns
Negative Mood	2.5(1.2)	2.6(1.3)	3.3(1.2)	ns
Intensity	3.6(1.0)	3.9(0.9)	3.8(1.6)	ns
Threshold	3.0(1.7)	3.2(1.3)	3.6(0.9)	ns
Grade 2				
N	52	52	35	
Approach/Withdrawal	5.6(1.0)	5.0(1.2)	4.1(1.3)	.01
Positive Mood	6.4(0.6)	5.9(0.9)	5.3(1.1)	.01
Adaptability	6.2(0.7)	5.5(1.0)	4.5(1.2)	.01
Persistence	5.5(0.9)	4.8(1.3)	3.5(1.4)	.01
Distractibility	3.3(1.1)	4.0(1.1)	4.9(1.1)	.01
Activity Level	1.9(1.1)	2.9(1.6)	4.1(1.8)	.01
Negative Mood	2.2(1.1)	2.5(1.4)	3.5(1.7)	.01
Intensity	3.9(1.2)	4.1(1.2)	4.4(1.5)	ns
Threshold	3.0(1.2)	2.8(1.4)	2.8(1.1)	ns

The temperament scales shown in Table 4-15 are grouped according to the magnitude of thrive-related differences. Five of the scales fairly consistently had the largest differences in all grades: activity, persistence, distractibility, adaptability, and the tendency to approach or withdraw from new situations. The positive and negative mood scales were also related to thrive status, but mean rating differences were smaller. Very small differences were found for intensity or threshold of responses.

There were some shifts in the magnitude of thrive-related differences in Kindergarten (similar in both Junior and Senior Kindergarten) and Grades 1 and 2. While activity, persistence, adaptability, and positive mood had very similar patterns in Kindergarten and Grade 2, distractibility and approach-withdrawal thrive differences declined somewhat. Negative mood differences increased in Grade 2.

Variations in these scales are clearly related to each other. This will be discussed in chapter 6. At this point, one can conclude that differences in the level of task persistence (including distractibility and activity level) and differences in responses to new situations (including both approaching and adapting to such situations), represent significant aspects of children's thrive status. Differences in mood are related to these, with negative mood associated with low task persistence and positive mood with tendencies to approach new situations.

Self-confidence

Three rating questions were used to assess self-confidence at all four grade levels.

1. When confronted with a new situation involving new skills, does the child make a good effort to try?[4] (Rated from 1 ["almost never"] to 5 ["nearly always"].)

2. When the child fails at a given task, what is his/her usual reaction? (Specific alternatives on a 5-point scale are described in Table 4-18).

3. Make a general assessment of the child's approach to most situations. (Rated from 1 ["not confident at all"] to 5 ["always very confident"].)

Mean ratings by grade and thrive group are shown in Table 4-16. Except for the usual reduction of thrive-related differences in Grade 1, these mean ratings indicated that the average non-thriver is typically rated as "sometimes" demonstrating self-confidence, while the typical thriver is rated as "often or usually" self-confident.

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4. Note that this item is similar to Chess and Thomas's approach/withdrawal scale. The underlying concepts are different - Thomas and Chess conceptualize an unconscious, automatic response to novelty, while in describing "self-confidence" one could expect a conscious sense of confidence or "feeling of efficacy" (Bandura, 1977). The overt behavioural indicators on which these charcteristics can be rated are difficult to disentangle.

Table 4-16
Self-confidence by Grade and Thrive Status
(standard deviations in parentheses)

	Thriving	Average	Non-thriving	sig.
Junior Kindergarten				
N	14	17	12	
Response to New Task	4.5(0.7)	4.1(0.7)	3.3(1.1)	.01
Response to Failure	4.0(0.9)	3.8(0.4)	2.9(0.9)	.01
General Self-confidence	4.0(0.9)	3.7(0.7)	2.9(0.9)	.01
Combined Self-confidence	4.2(0.7)	3.8(0.5)	3.1(0.6)	.01
Senior Kindergarten				
N	44	44	32	
Response to New Task	4.7(0.5)	4.2(0.7)	3.2(1.1)	.01
Response to Failure	4.3(0.6)	3.7(0.7)	3.0(0.8)	.01
General Self-confidence	4.4(0.7)	3.6(0.8)	2.6(0.9)	.01
Combined Self-confidence	4.5(0.5)	3.8(0.6)	2.9(0.8)	.01
Grade 1				
N	22	26	17	
Response to New Task	4.4(0.7)	4.1(0.8)	3.8(0.4)	.02
Response to Failure	3.1(1.0)	3.6(1.1)	3.4(0.9)	ns
General Self-confidence	3.8(0.9)	3.7(1.0)	3.4(0.8)	ns
Combined Self-confidence	4.0(0.7)	3.8(0.9)	3.5(0.6)	ns
Grade 2				
N	52	52	35	
Response to New Task	4.7(0.6)	4.3(0.8)	3.2(0.9)	.01
Response to Failure	3.9(0.6)	3.7(0.9)	3.1(0.9)	.01
General Self-confidence	4.2(0.7)	3.7(0.6)	3.1(0.7)	.01
Combined Self-confidence	4.3(0.6)	3.9(0.7)	3.1(0.7)	.01

Table 4-17 illustrates responses to self-confidence question #2 concerning responses to failure. In this table, it is clear that virtually all children rated as responding "very positively" to failure were thrivers. Kindergarten non-thrivers most frequently were rated as having neutral reactions to failure, while roughly a quarter were reported to have negative responses. By Grade 1 or 2, a quarter of non-thrivers were still reported as demonstrating negative responses to failure, but the majority were now in the "positive-try again" category - a very encouraging finding.

Table 4-17

Per Cent Reported Responses to Failure by Thrive Status

	N	Response Category				
		Very negative: may throw tantrum; unlikely to try again	Negative: self-confidence lower next time	No reaction: doesn't seem to care; may or may not try again	Positive: not upset; more determined to succeed next time	Very positive, very determined and confident next time
Junior K.						
Thriving	14	0	7	14	50	29
Average	17	0	0	24	76	0
Non-thriving	12	8	17	50	25	0
Senior K.						
Thriving	43	0	2	0	67	30
Average	43	0	12	14	70	5
Non-thriving	32	0	28	44	28	0
Grade 1						
Thriving	22	0	14	14	50	23
Average	26	0	23	15	38	23
Non-thriving	17	0	24	18	53	6
Grade 2						
Thriving	52	0	12	8	56	25
Average	52	2	12	15	62	10
Non-thriving	35	0	29	29	43	0

Self-direction

Self-direction involves the individual's ability to form or accept a plan and to carry it out successfully. Two sources of information were used to assess individual differences in self-direction: tester ratings of children's test-taking strategies and self-control, and teacher ratings of self-direction in four contexts: free time in class, classroom management routines (e.g., behaviour guidelines); academic routines (e.g., using dictionary, etc. on one's own); and teacher-set tasks (e.g., following instructions on tasks). The tester ratings have some validity as indexed by higher concurrent correlations with teacher ratings of self-direction in Grade 1 and 2 than with any other measures. (See chapter 7. Note that neither testers nor teachers were aware of children's kindergarten thrive ratings in 1980.)

Tester ratings by kindergarten thrive status are shown in Table 4-18. Differences do not appear large due to a response scale ranging from 1 ("rarely, never") through 2 ("occasionally") to 3 ("usually, often"). The usual smaller differences in Grade 1 occurred.

Table 4-18
Tester-rated Test Strategy and Self-control
by Grade and Thrive Status
(standard deviations in parentheses)

	Thriving	Average	Non-thriving	sig.
Junior Kindergarten				
N	22	27	20	
Test Strategy	2.6(0.4)	2.4(0.6)	2.1(0.6)	.01
Self-control	1.3(0.3)	1.4(0.3)	1.6(0.4)	.01
Senior Kindergarten				
N	54	53	37	
Test Strategy	3.0(0.1)	2.9(0.3)	2.5(0.5)	.01
Self-control	1.2(0.2)	1.3(0.3)	1.4(0.4)	.01
Grade 1				
N	22	27	20	
Test Strategy	2.7(0.3)	2.7(0.3)	2.7(0.4)	ns
Self-control	1.2(0.4)	1.2(0.3)	1.1(0.2)	ns
Grade 2				
N	53	53	37	
Test Strategy	2.8(0.3)	2.7(0.3)	2.4(0.4)	.01
Self-control	1.0(0.1)	1.1(0.2)	1.2(0.3)	.01

Patterns of response are illustrated in Table 4-19. This table shows the distribution of responses on CIRCUS Behavior Inventory item 13, "seemed to weigh alternative choices to a question carefully", which was one of three items used in the "test strategy" scale.

Table 4-19
Percentages of Children Described by Testers
as "Usually or Often Weighing Alternatives Carefully"
by Thrive Status

Grade	Thriving	Average	Non-thriving
Grade 1	41	48	45
Grade 2	60	57	30

Table 4-20 shows teacher ratings of self-direction in Grades 1 and 2 by thrive status. (This measure was not developed in 1978.) Response on this scale ranges from 1 ("rarely") through 3 ("about half the time") to 5 ("usually, almost always"). As usual, thrive-related differences were smaller in Grade 1. In Grade 2, non-thrivers' mean scores were in the "about half the time" range, while thrivers' mean ratings fell between "often-frequently" and "usually-almost always". There were no major differences in the subscales.

Table 4-20
Teacher-rated Self-direction by Grade and Thrive Status
(standard deviations in parentheses)

	Thriving	Average	Non-thriving	sig.
Grade 1				
N	18	25	20	
Free Time	4.2(0.9)	3.9(1.0)	3.3(1.5)	.05
Classroom Management	4.3(0.8)	4.3(0.9)	3.9(0.9)	ns
Academic Routines	4.1(0.8)	3.8(1.0)	3.5(1.0)	ns
Teacher-set Tasks	4.1(1.0)	4.0(0.9)	3.5(1.0)	ns
Combined Self-direction	4.2(0.7)	4.1(0.7)	3.6(0.9)	.05
Grade 2				
N	54	52	35	
Free Time	4.5(0.7)	3.8(0.9)	2.9(1.2)	.01
Classroom Management	4.4(0.8)	4.0(0.9)	3.2(1.2)	.01
Academic Routines	4.4(0.6)	3.9(0.9)	2.9(1.0)	.01
Teacher-set Tasks	4.6(0.5)	4.2(0.8)	3.3(1.2)	.01
Combined Self-direction	4.5(0.5)	4.0(0.7)	3.1(0.9)	.01

Responses to this rating scale are illustrated in Table 4-21, which shows responses to self-direction question #3, "After choosing an activity or project, child can plan and carry it through to completion with a minimum of adult supervision".

Table 4-21
Responses to Self-direction Item #3 Concerning
Completing Projects by Thrive Status
(percentages)

	N	Response				
		Rarely	Sometimes	About Half the time	Often, frequently	Usually, almost always
Grade 1						
Thriving	18	0	11	11	44	33
Average	25	4	4	28	36	28
Non-thriving	20	20	20	15	15	30
Grade 2						
Thriving	54	0	2	7	26	63
Average	52	2	11	20	30	33
Non-thriving	35	29	11	23	23	14

Kindergarten Thrive Status - Summary

The findings in this chapter may be summarized as follows:

1. Children identified in Junior or Senior Kindergarten as "thriving", "average", or "non-thriving" in terms of their teachers' goals differed on measures of productive language, academic skills, social skills, temperament, and task-rated self-direction in Junior and Senior Kindergarten.

2. Two years later, most of these differences persisted in Grade 2 but were much attenuated in Grade 1. Working memory for concrete operations and teacher-rated self-direction were assessed in Grades 1 and 2, but thrive-related differences were found only in Grade 2.

3. No thrive-related differences were found for children's health (indexed by days absent from school) or age. (See chapter 3).

Taken together, these findings suggest the following conclusion:

1. Kindergarten teachers' concepts of "thriving" in school settings concern both academic and social and emotional functioning. It seems probable that teachers use evidence from both these areas in judging thrive status. However, it is possible that the variables themselves are highly correlated and that assessments based on one area will also affect outcomes in the other.

2. Senior Kindergarten teachers' perceptions of thriving in school are strong indicators of how well children will be functioning two years later.

3. Junior Kindergarten teachers' perceptions of thriving in school were much poorer indicators of functioning two years later, although it is apparent from point #1 above that Junior Kindergarten teachers were using the same kinds of criteria as Senior Kindergarten teachers. The lower predictive power of Junior Kindergarten teachers' thrive ratings may be attributable to greater susceptibility of Junior Kindergarten children to environmental influences over the succeeding years, to maturational factors that do not appear until after age four, or both.

4. At least three of the measures that reliably distinguished between thrivers and non-thrivers in Grade 2 have substantial constitutional components. These are:

a. working memory for concrete operations
b. grammatical skills
c. letter-naming speed

This appears that part of the difference between thriving and non-thriving children reflects constitutional differences. However, as we shall see in the next three chapters, these variables alone do not account for most other differences that distinguish thriving from non-thriving children.

5 Effects of Different Types of Kindergarten programs on Children's Functioning in Kindergarten and in Grades 1 and 2

The other major purpose of the 1978 and 1980 studies was to examine the impact of different types of kindergarten experiences on various aspects of children's functioning - health, language and academic skills, social skills, temperament, self-confidence and self-direction, and behavioural preferences. Two types of differences were examined for children in a longitudinal sample: simple average differences between children from the different programs, and interactions with thrive status. Significant interactions would indicate that two or more programs had significantly different effects on children perceived as thriving, average, or non-thriving by their kindergarten teachers. As it turns out, no significant interactions between program and thrive status occurred.

A large majority of characteristics studied showed no systematic relationship to the type of kindergarten program attended, in either Kindergarten or Grades 1 or 2. In this chapter, we will discuss only those measures that did show program-related differences (summarized in Table 5-1). We will not discuss measures for which no program-related differences were found (summarized in Table 5-2). Tables providing data on "no difference" measures are given in Appendix B, Tables B-1 to B-13.

Table 5-1
Measures for Which
Statistically Significant Differences
Were Related to Kindergarten Program

Aspect of Functioning	Junior or Senior	Grades 1 or 2
Health	Days absent for illness	(differences)
General Intellectual Capacity	(not given)	Working Memory Test
Language Skills	(no differences)	Vocabulary - parts of the Bankson Vocabulary Tests
	Grammar - CIRCUS Functional Languages Test	Grammar - parts of the Bankson Functional Language Test
	Verbal fluency - words used in telling a story	(no differences)
Academic Skills	(not given)	Reading - Biemiller Reading Times Test
Social Skills	Teacher ratings of peer, adult, adult-led group, and empathy skills	(no differences)
Temperament	Teacher ratings of most temperamental characteristics	Teacher ratings of distractibility and threshold
Self-confidence	General self-confidence	(no differences)
Self-direction	(not given)	Tester ratings of children's test-taking strategies

Table 5-2
Measures for Which No
Statistically Significant Differences
Were Related to Kindergarten Program[a]
(or Interactions Between Programs and Thrive Status)

Aspect of Functioning	Junior or Senior	Grades 1 or 2
Health	(see Table 5-1)	Days absent for illness
Language Skills	Vocabulary - CIRCUS Pennies Test	(see Table 5-1)
Academis Skills	Mathematics - CIRCUS Number Recognition, and How Much and How Many Tests	Mathematics - MAT Mathematics Computation Tests
Social Skills	(see Table 5-1)	All measures
Self-confidence	(not given)	Teacher ratings of responses to new situations, failure, and general self-confidence
Self-direction	Tester ratings of children's test-taking strategies	(see Table 5-1)
	(not given)	Teacher ratings of children's self-direction in various aspects of classroom activities

a. Tables for all measures listed here are provided in Appendix B.

Health

Half-day Junior and Senior Kindergarten children were absent for significantly more days than children in other kindergarten programs. There were no other significant differences in Grade 1 or 2 attendance, although children who had attended half-day programs were still absent slightly more often. (See Table 5-3.) In short, there was clearly no evidence that alternate full-day or full-day kindergarten programs contributed to health problems as indexed by absences for illness.

General Intellectual Capacity

A measure of concrete operational working memory was used to roughly assess mental maturity. This non-verbal measure was developed by De Avila and modified by Case, and Kurland, and Goldberg (1982). Table 5-4 indicates that children from the UFD kindergarten programs had slightly lower mean working memories than children from the other programs, while HD Grade 2 children had higher mean working memory scores. These effects presum-ably reflect differences in the samples rather than effects of schooling, since schooling does not deal directly with working memory, and working memory is extremely difficult to modify with practice (Kurland, 1981).

Table 5-3

Days Absent for Illness by Program and Grade[a]

Grade	HD	AFD	RFD	UFD	SIG.
Junior K					
N	22	42			
$\bar{x}$ (sd)	15.3(9.6)	10.5(10.8)[b]			.05
Senior K					
N	27	40	43	19	
$\bar{x}$ (sd)	14.1(14.2)	7.0(3.5)[b]	7.6(6.8)	8.3(5.4)	.05
Grade 1					
N	24	41			
$\bar{x}$ (sd)	7.1(3.7)	5.7(4.6)			ns
Grade 2					
N	32	40	41	25	
$\bar{x}$ (sd)	6.7(6.2)	5.3(3.3)	4.0(4.4)	4.9(5.8)	ns

a. Mean days absent calculated as the average of thriving, average, and non-thriving children means to adjust for differences in numbers of thriving, average and non-thriving children in each program.

b. Number of days and standard deviations doubled to adjust for fact that alternate full-day children attended school for half as many days as other children.

Table 5-4

Mean Working Memory by Program and Grade

	HD	AFD	RFD	UFD	sig (Chi Square)
Grade 1					
N	27	42			
$\bar{x}$[a]	2.16	2.20			ns
Grade 2					
N	34	40	45	25	
$\bar{x}$[a]	2.62	2.28	2.39	2.19	ns[b]

a. Standard deviations not available.

b. Chi square adjusted for differences in number of children in thrive categories.

Language Skills

Productive language skills were assessed in 1978 using the CIRCUS Say and Tell Test, and in 1980 using the Bankson Language Test.

Vocabulary. No direct vocabulary test was given in the 1978 test. An assessment of descriptive language was given by having children describe two pennies. No program-related differences were found on this test. (See Table B-1.)

The 1980 Bankson Test contained four vocabulary subscales and combined vocabulary scale. While there were some "statistically significant" differences between children from different kindergarten programs, the absolute magnitude of these differences was very small for Grade 2 children. The combined scores ranged from 85 per cent correct (UFD) to 89 per cent correct (HD). Grade 1 children from both programs had combined vocabulary scores of 83 per cent. (See Table B-2.)

Grammar. The 1978 CIRCUS Test included an assessment of "functional language" involving the child's abilities to pluralize and use tense, prepositions, possessives, and imperatives.

Table 5-5 shows results for this test. There were no program-related differences in Junior Kindergarten. Senior Kindergarten half-day children had significantly higher scores than children from other programs.

Table 5-5
1978 Functional Language (Grammar) Scores
by Grade and Program

	Junior Kindergarten			Senior Kindergarten				
	HD	AFD	sig.	HD	AFD	RFD	UFD	sig.
N	27	42		34	40	45	25	
$\bar{x}$(sd)	51.3(8.6)	48.3(9.5)	ns	60.9(7.8)	56.8(7.0)	54.1(8.8)	55.4(8.1)	.001

The 1980 Bankson Test contained four subscales involving grammar. Virtually no significant program differences appeared on these tests. Overall, scores in Grade 2 ranged from 89 to 92 per cent. Both Grade 1 groups averaged 85 per cent. Details are given in Table B-3.

Narration. In both 1978 and 1980 children were shown a complex picture of a circus, and asked to tell a story to go with the picture. The total number of words used in the story was recorded. Program differences were found in Senior Kindergarten and Grade 2, with AFD children highest in Senior Kindergarten and RFD children highest in Grade 2. These data do not suggest any clear pattern of effects of type of program. (For example, although the rural full-day group was highest in Grade 2, the urban full-day group was lowest.)

Data are shown in Table B-4.

Academic Skills

Mathematics. No program-related differences were found in either Kindergarten (CIRCUS Number Recognition, and How Much and How Many) or Grades 1 or 2 (MAT Mathematics Computation). (See Tables B-5 and B-6.)

Reading. No program-related differences were found for Kindergarten (CIRCUS Letter Recognition) or Grade 1 and 2 (MAT Word Knowledge) (See Tables B-7 and B-8). Same program differences were found on the Biemiller Test of Reading Processes, with Grade 2 children in the urban full-day program taking longer to identify letters than other children. This measure indexes constitutional readiness for reading. (See Table B-9.)

Social Skills

Statistically significant but minor program-related differences were found for Senior Kindergarten children, with urban full-day children receiving slightly lower ratings than children from other programs. (See Table 5-6.)

Temperament

Junior Kindergarten AFD children were rated as demonstrating slightly less positive and negative moods than HD children. Otherwise, there were no program-related temperament differences among Junior Kindergarten children.

Senior Kindergarten children differed significantly on a number of temperamental dimensions, with UFD children receiving the lowest ratings on approach/withdrawal, positive mood, adaptability, and intensity of reaction, and the highest ratings on distractibility. Rural full-day children received the lowest ratings on persistence and highest ratings on activity. Otherwise, RFD children did not receive markedly different ratings from children in other types of kindergarten programs, indicating that full-day programs per se were not responsible for program differences. (See Table 5-7.)

Program-related differences in temperament rating disappeared in Grades 1 and 2. (See Table B-10)

Self-confidence

Results similar to those for temperament occurred with self-confidence ratings. Urban full-day kindergarten children received significantly lower ratings for general and combined self-confidence. (See Table 5-8.)

Table 5-6
Social Abilities by Grade and Program[a]
(standard deviations in parentheses)

	HD	AFD	RFD	UFD	sig.
Junior K					
N	19	37			
Peer Skills	3.5(1.1	3.7(0.9)			ns
Adult Skills	3.9(0.6)	3.8(0.7)			ns
Adult-led Groups	4.1(0.9)	4.0(0.8)			ns
Empathy	3.0(1.0)	3.5(0.8)			.05
Senior K					
N	33	34	36	25	
Peer Skills	3.3(1.0)	3.8(0.8)	3.6(1.0)	3.2(1.0)	.07
Adult Skills	3.4(0.9)	4.1(0.8)	3.8(0.9)	3.4(1.0)	.02
Adult-led Groups	4.2(0.7)	4.2(0.6)	4.3(0.8)	3.7(0.7)	.04
Empathy	3.5(1.1)	3.7(0.8)	3.9(0.9)	3.4(1.1)	ns
Grade 1					
N	23	41			
Peer Skills	3.9(1.0)	3.4(0.9)			ns
Adult Skills	4.5(0.7)	3.9(0.9)			ns
Adult-led Groups	4.2(0.9)	4.3(0.6)			ns
Empathy	3.8(1.0)	3.6(1.0)			ns
Grade 2					
N	31	40	40	19	
Peer Skills	3.7(0.8)	3.7(1.1)	3.5(0.9)	3.4(0.9)	ns
Adult Skills	3.9(0.9)	3.8(1.0)	3.7(0.9)	3.6(1.1)	ns
Adult-led Groups	3.9(0.8)	4.3(0.8)	4.2(0.6)	3.9(1.0)	ns
Empathy	3.5(0.8)	3.7(0.9)	3.6(0.8)	3.5(1.2)	ns

a. See note a on Table 5-3.

Table 5-7

Temperament Scales by Program and Grade

	Junior Kindergarten			Senior Kindergarten				
	HD	AFD	sig.	HD	AFD	RFD	UFD	sig.
N	21	36		34	33	36	20	
Approach/ Withdrawal	4.9(1.6)	4.3(1.8)	ns	4.6(1.6)	5.0(1.2)	5.1(1.0)	4.1(1.6)	.06
Positive Mood	6.3(0.7)	5.6(0.9)	.001	6.2(0.8)	5.9(0.7)	6.0(1.1)	5.4(1.2)	.06
Adaptability	5.5(1.5)	5.1(1.6)	ns	6.0(0.9)	5.3(1.4)	5.5(1.5)	5.1(1.5)	.05
Persistence	4.1(1.3)	4.5(1.0)	ns	4.9(1.1)	4.4(1.1)	3.9(1.4)	4.1(1.3)	.02
Distractibility	4.0(1.5)	3.6(1.5)	ns	2.9(1.3)	3.6(1.6)	4.2(1.9)	4.0(2.0)	.02
Activity	3.2(1.7)	2.6(1.3)	ns	2.3(1.4)	2.5(1.2)	3.8(1.9)	2.9(1.6)	.001
Negative Mood	3.1(1.3)	2.4(1.0)	.02	3.0(1.4)	2.8(1.2)	3.1(1.5)	2.8(1.5)	ns
Intensity	5.0(1.1)	3.6(1.3)	.001	4.2(1.3)	4.1(1.1)	4.2(1.3)	3.1(1.3)	.01
Threshold	3.7(1.4)	2.3(1.0)	.001	2.9(1.1)	2.8(1.3)	3.1(1.1)	2.7(1.4)	ns

Table 5-8
Self-confidence Items in Kindergarten by Program
(standard deviations in parentheses)

	HD	AFD	RFD	UFD	sig.
Junior Kindergarten					
N	67	36			
Response to New Task	4.3(0.8)	3.9(0.9)			ns
Response to Failure	3.6(1.0)	3.6(1.0)			ns
General Self-confidence	3.7(1.1)	3.5(0.9)			ns
Combined Self-confidence	3.9(0.8)	3.7(0.7)			ns
Senior Kindergarten					
N	26	32	36	24	
Response to New Task	4.2(0.7)	3.8(1.0)	4.2(1.0)	3.8(1.1)	ns
Response to Failure	3.8(0.7)	3.6(0.9)	3.8(0.7)	3.4(1.1)	ns
General Self-confidence	3.7(1.0)	3.6(0.9)	3.6(1.2)	3.2(1.2)	.05
Combined Self-confidence	3.9(0.7)	3.6(0.8)	3.9(0.9)	3.4(1.0)	.06

a. See note a on Table 5-3.

Again, program-related differences in self-confidence ratings disappeared in Grades 1 and 2. (See Table B-11.)

Self-direction

Self-direction was assessed two ways. In both 1978 and 1980, testers rated children's behaviour in the test situation. Three items concerning the child's strategy on the test were combined: considering answers carefully, answering randomly, and keeping place. These were thought to reflect a conscious, self-directed approach to the test versus a non-self-directed approach.

In 1980, teachers rated four aspects of self-direction in classroom, including use of free time activities, following classroom routines (e.g., putting things away without being reminded), following academic routines, and carrying out tasks set by the teacher without requiring repeated instructions.

No program-related differences were found in tester-rated test strategies in Kindergarten. Small but statistically significant differences did occur in Grade 2, ranging from a mean rating of 2.6 (out of a possible 3) for rural and urban full-day programs to 2.9 for children from half-day programs. (See Table B-12.)

No program-related differences were found for teacher-rated self-direction. (See Table B-13.)

Program Effects - Summary

Overall, very few program-related effects were found. Most differences occurred in Senior Kindergarten. Most involved lower or less "thrive-like" functions (see chapter 4) in social and temperamental characteristics in the urban full-day group. Since these findings did not hold for the rural full-day group, it seems likely that the "program differences" reflect population differences rather than program differences. In general, these differences had disappeared by Grade 2.

In short, the type of kindergarten program children attend (half-day), or full-day appears to produce little difference between children either while they are in Kindergarten or two years later.

6 Changes in Perceived Thrive Status Between Kindergarten and Grades 1 and 2

Introduction

As described in chapter 1, the children studied were originally selected by their kindergarten teachers on the basis of perceived "thriving", "average", or "not as yet thriving" status. In 1980, following all testing and rating procedures, Grade 1 and 2 teachers were asked to place children in categories similar to the original "thrive" ratings. This was done by asking the teacher to think of the entire class as falling into three groups - one third "thriving in terms of your goals", one third "making average progress in terms of your goals", and one third "not as yet thriving in terms of your goals".

Tables 6-1 and 6-2 show the distribution of 1980 thrive ratings by 1978 thrive ratings. It is clear in these tables that many Junior and Senior Kindergarten non-thrivers and average children were perceived to be functioning more effectively in Grades 1 and 2. Some kindergarten thrivers were perceived to be functioning at average levels in Grades 1 and 2.

Table 6-1
Distribution of 1978 Junior Kindergarten
Thrive Ratings by 1980 Grade 1
Thrive Ratings

		Grade 1 Thrive Rating		
		Thriving	Average	Non-thriving
Junior Kindergarten Thrive Rating	Thriving	17	3	2
	Average	14	8	5
	Non-thriving	4	10	6

Table 6-2
Distribution of 1978 Senior Kindergarten
Thrive Ratings by 1980 Grade 2
Thrive Ratings[a]

		Grade 2 Thrive Rating		
		Thriving	Average	Non-thriving
Senior Kindergarten Thrive Rating	Thriving	42	11	0
	Average	25	24	2
	Non-thriving	4	10	6

a. Thrive ratings were missing for 5 children in 1980.

The purpose of this chapter is to examine differences between children whose thrive status <u>changed</u> between 1978 and 1980, and those whose status did <u>not change</u>. We will be examining 1980 data to see if changes in perceived thrive status are associated with differences in test performance, and in rated social skills, temperament, self-confidence, and self-direction. We will also examine 1978 data to see if any of these variables could predict changes in thrive status. Finally, we will consider demographic characteristics that might be associated with changes in thrive status.

In order to examine changes in thrive status, six groups were constructed from each cohort. These six groups consisted of:

1. 1980 non-thrivers who were non-thrivers in 1978
2. 1980 average children who were non-thrivers in 1978
3. 1980 average children who were average in 1978
4. 1980 average children who were thrivers in 1978
5. 1980 thrivers who were average in 1978
6. 1980 thrivers who were thrivers in 1978

Relationship Between Changes in Thrive Status and Measures in Grade 1 or 2

Age. Consistent Grade 2 non-thrivers were younger than 1978 non-thrivers who changed to average in 1980. No similar finding held for Grade 1 children, nor were changes between average and thriving status related to age. (See Table 6-3.)

Table 6-3
Mean Age in 1980 by 1978 and 1980 Thrive Status

1980	Non-thriving	Average			Thriving	
1980	Non-thriving	Non-thriving	Avg.	Thriving	Avg.	Thriving
N						
Grade 1	6	9	8	3	14	16
Grade 2	13	21	23	11	24	42
Mean Age (months)						
Grade 1	80.7	81.2	82.1	84.7	82.0	85.9
Grade 2	85.9	92.5	94.6	95.3	94.3	95.3

Language. Performance on the Bankson Language Test was related to 1978 thrive ratings (See chapter 5). No differences were associated with changes in thrive status in 1980.

Academic Skills. Shifts between average and thriving status were related to reading performance in 1980 as indexed by MAT Word Knowledge, Letter Time, Word Time, and Text Time. (See Table 6-4.)

Shifts between non-thriving and average status were related to MAT Mathematics Computation (data available for Grade 2 only). (See Table 6-4.)

Table 6-4
Mean Scores on 1980 Academic Skills Tests
by 1978 and 1980 thrive Status

1980	Non-thriving	Average			Thriving	
1978	Non-thriving	Non-thriving	Avg.	Thriving	Avg.	Thriving
N / JK	6	10	8	3	14	17
SK	13	21	24	10	25	42
Math. Comput.[a]						
Gr. 2 (standard score)	39.1	49.7	53.4	58.4	57.2	62.0
Word Knowledge						
Gr. 1 (standard score)	33.3	40.0	40.1	43.3	48.1	51.5
Gr. 2 (standard score)	46.8	48.6	56.0	59.8	63.1	67.7
Letter Time						
Gr. 1 (sec./letter)	1.11	1.22	1.21	.92	.85	.80
Gr. 2 (sec./letter)	.90	.88	.75	.70	.66	.63
Word Time[b]						
Gr. 2 (sec./word)	1.32	1.00	.93	.78	.76	.71
Text Time[b]						
Gr. 2 (sec./word)	.87	.80	.61	.52	.47	.40

a. Data available for Senior Kindergarten only.

b. Junior Kindergarten children made too many mistakes to assess reading times for words or text.

Overall, there is a fairly consistent pattern of increasing levels of performance as we move from children perceived as non-thrivers in both years to children perceived as thrivers in both years. In general these data imply that where teachers perceived different thrive levels in 1980 compared with 1978, their perceptions were justified in terms of real differences in academic performance. This also, of course, indicates that academic performance continued to be a part of teachers' concepts of "thriving" in Grades 1 and 2.

Social Skills. Social skills involving peers, adults, and adult-led groups were reflected in 1980 Grade 2 teachers' distinctions between non-thriving and average children, although 1978 non-thrivers who were average in 1980 received lower mean scores than children who were average in both years. Children perceived as thriving in both years received higher social skill ratings than other children, but not by much. (See Table 6-5.) Results for Grade 1 children are unclear.

Table 6-5
Mean Ratings on 1980 Social Skills Scales
by 1978 and 1980 Thrive Status

1980	Non-Thrive	Average			Thrive	
1978	Non-Thrive	Non-Thrive	Avg.	Thrive	Avg.	Thrive
N						
Grade 1	6	10	8	3	14	17
Grade 2	13	21	24	10	25	42
Peer Skills						
Grade 1	2.9	3.3	3.4	3.6	4.1	3.9
Grade 2	2.4	3.3	3.5	3.8	3.9	4.2
Adult Skills						
Grade 1	4.9	3.9	3.7	3.8	4.5	4.0
Grade 2	2.8	3.6	3.9	3.9	3.8	4.2
Adult-led Group Skills						
Grade 1	3.7	4.1	4.2	4.0	4.6	4.7
Grade 2	3.0	3.5	4.0	4.3	4.5	4.8
Empathy						
Grade 1	2.9	3.7	3.6	2.8	4.2	3.8
Grade 2	2.6	3.0	3.8	3.7	3.7	4.1

Temperament. Table 6-6 shows the relationship between mean ratings on 1980 temperament scales and changes in thrive ratings. For Grade 2 children, the overall pattern reported for previous measures holds. That is, the greatest difference was between the scores of consistent non-thrivers and consistent thrivers. In addition, the temperamental traits of adaptability, persistence, and activity discriminated sharply between consistent non-thrivers and 1978 non-thrivers who were perceived as average in 1980. None of the measures discriminated sharply between 1980 average children and 1980 thrivers, although 1980 thrivers received slightly higher scores on persistence, and lower scores on activity and distractibility, than did 1980 average children. On measures relating to new situations (approach/withrawal and adaptability), 1980 thrivers and 1978 thrivers who were average in 1980 had higher scores than other average children. No differences were found for threshold or intensity.

Similar trends held for Grade 1 children, although the difference was not as large.

Table 6-6

Mean Ratings on 1980 Temperament Scales

by 1978 and 1980 Thrive Status

	1980 Non-Thrive	Average			Thrive	
	1978 Non-Thrive	Non-Thrive	Avg.	Thrive	Ave.	Thrive
N						
JK	5	9	7	3	14	17
SK	13	21	24	11	25	41
Approach/ Withdrawal						
JK	3.0	4.1	4.1	4.8	5.2	5.2
SK	3.6	4.4	4.8	5.4	5.3	5.6
Adaptability						
JK	4.0	4.6	5.0	5.2	6.0	6.1
SK	3.5	5.1	5.2	6.1	5.9	6.3
Persistence						
JK	3.7	4.6	4.4	4.2	5.6	5.6
SK	2.8	3.9	4.2	4.5	5.3	5.8
Distract-ibility						
JK	5.3	4.1	4.0	4.0	3.5	3.9
SK	5.3	4.7	4.4	4.2	3.6	3.1
Activity						
JK	4.7	2.7	3.4	3.3	1.9	1.9
SK	4.8	3.6	3.3	2.7	2.4	1.7
Positive Mood						
JK	5.2	5.3	5.3	5.2	6.0	5.9
SK	4.8	5.5	5.8	6.0	6.0	6.6
Negative Mood						
JK	3.4	3.0	3.1	2.8	1.9	2.3
SK	4.0	3.3	2.8	2.8	2.2	2.0

Self-confidence. Findings for 1980 self-confidence ratings parallel those for other measures. (See Table 6-7.) Grade 2 ratings for response to new skill and response to failure clearly reflect 1980 thrive status. On general self-confidence, children who were average in 1978 but thriving in 1980 received lower ratings than those who were thriving in both years. Non-thrivers in both years received significantly lower ratings than 1978 non-thrivers who were perceived as average in 1980.

Similar patterns held for Grade 1 children, but differences were smaller, especially for consistent non-thrivers.

Table 6-7
Mean 1980 Self-confidence Ratings
by 1978 and 1980 Thrive Status

1980	Non-Thrive	Average			Thrive	
1978	Non-Thrive	Non-Thrive	Avg.	Thrive	Avg.	Thrive
N						
Grade 1	5	9	7	3	14	17
Grade 2	13	21	24	11	25	41
Response to New Task						
Grade 1	3.2	4.0	3.7	3.7	4.6	4.7
Grade 2	2.8	3.4	4.0	4.2	4.6	4.8
Response to Failure						
Grade 1	3.2	3.6	3.3	3.7	4.2	3.9
Grade 2	2.5	3.5	3.4	3.5	4.0	4.1
General Self-confidence						
Grade 1	2.8	3.7	3.3	3.3	4.3	4.1
Grade 2	2.6	3.3	3.5	3.7	3.9	4.4

Self-direction. Data is available from both testers' ratings on the CIRCUS Behavior Inventory (combined scores for "keeping place", "considering answers carefully", and "not answering randomly") and teachers' ratings on the four self-direction scales.

Tester ratings discriminated between consistent non-thrivers and all other thrive groups in Grade 1 and 2. 1980 Grade 2 thrivers received slightly higher tester ratings than other children. (See Table 6-8.)

Teacher ratings for both Grades 1 and 2 discriminated between consistent non-thrivers and the other thrive groups on two of the four subscales (free time and teacher-set tasks) and the combined scales. 1980 Grade 2 thrivers had significantly higher self-direction ratings on academic routines and the combined scales, and generally higher scores on all scales in both grades. There were no differences within 1980 thrive groups associated with variations in 1978 thrive status. (See Table 6-8.)

Table 6-8
1980 Self-direction Ratings
by 1978 and 1980 Thrive Status

1980	Non-Thrive	Average			Thrive	
1978	Non-Thrive	Non-Thrive	Avg.	Thrive	Avg.	Thrive
N						
Grade 1	6	10	8	3	14	17
Grade 2	13	21	24	11	25	42
Tester-rated Behaviour[a]						
Grade 1	2.3	2.8	2.6	2.8	2.8	2.7
Grade 2	2.3	2.5	2.7	2.6	2.8	2.9
Free Time[b]						
Grade 1	1.9	3.6	3.6	4.0	4.3	4.4
Grade 2	2.0	3.4	3.2	3.9	4.3	4.6
Classroom Management[b]						
Grade 1	3.3	4.1	4.3	3.9	4.7	4.5
Grade 2	2.5	3.6	3.6	3.9	4.4	4.5
Academic Routines[b]						
Grade 1	2.5	3.6	3.5	3.8	4.4	4.3
Grade 2	2.2	3.3	3.5	3.5	4.4	4.6
Teacher-set Tasks[b]						
Grade 1	2.5	3.9	3.9	3.8	4.4	4.4
Grade 2	2.6	3.6	3.8	4.1	4.6	4.8
Combined Teacher Ratings						
Grade 1	2.4	3.8	3.9	3.6	4.4	4.5
Grade 2	2.3	3.4	3.6	3.8	4.4	4.6

a. Ratings range from 1.0 to 3.0

b. Ratings range from 1.0 to 5.0

Summary. Sixty-five per cent of kindergarten non-thrivers were perceived as average or thriving by their grade 1 or 2 teachers. Fifty per cent of kindergarten average children were perceived as thriving in Grades 1 or 2, while 21 per cent of kindergarten thrivers were perceived as average or non-thriving in Grades 1 or 2. Comparison of children whose perceived status had changed with those whose status had not changed indicated that these shifts were not merely a tendency to give children more favourable ratings. Both academic test scores in 1980 and ratings of social skills, temperament, self-confidence, and self-direction clearly discriminated between consistent non-thrivers and 1978 non-thrivers who were perceived as average in 1980. Children classed as thriving in 1978 between average in 1980 had lower reading scores and differed in temperament ratings involving persistence, distractibility, and activity, as well as in self-confidence and some self-direction ratings. Language scores did not reflect shifts in 1980 thrive ratings.

In the next section, we will examine 1978 measures that predicted changes in thrive status.

Relationships Between Changes in Thrive Status and Measures in Junior and Senior Kindergarten.

Language. None of the 1978 language assessments discriminated between children who changed status and those who did not.

Academic Skills. The only 1978 academic test predicting a change in thrive status was Number Recognition for Senior Kindergarten children which identified 1978 non-thrivers who were average in 1980, and 1978 average children who were thriving in 1980. No similar results were found for Junior Kindergarten children. (See Table 6-9.) It is particularly interesting to note that the most cognitively complex test given in 1978, CIRCUS How Much and How Many, did not predict thrive status changes in 1980.

Table 6-9
Mean Scores on 1978 Number Recognition Tests
by 1978 and 1980 Thrive Status

1978	Non-thriving	Average			Thriving	
1980	Non-thriving	Non-thriving	Avg.	Thriving	Avg.	Thriving
N						
JK	6	10	8	3	14	17
SK	13	21	24	11	25	42
Mean Scores[a]						
JK	2.5	2.3	3.0	3.3	3.3	3.5
SK	3.0	3.7	3.8	4.1	4.1	4.4

a. Maximum possible score is 5.

Academic Skills. The only 1978 academic test predicting a change in thrive status was Number Recognition for Senior Kindergarten children which identified 1978 non-thrivers who were average in 1980, and 1978 average children who were thriving in 1980. No similar results were found for Junior Kindergarten children. (See Table 6-9.) It is particularly interesting to note that the most cognitively complex test given in 1978, CIRCUS How Much and How Many, did not predict thrive status changes in 1980.

Social Skills. None of the 1978 social skills measures predicted changes in thrive status between 1978 and 1980.

Temperament. Several temperament scales were the most effective predictors of change in thrive status, but only for Senior Kindergarten children. Specifically, the scales for adaptability, persistence, distractibility, activity level, and positive mood discriminated between consistent non-thrivers and 1978 non-thrivers who were average in 1980. However, these scales did not clearly predict changes between average and thrive status in either direction. (See Table 6-10.)

It is important to note that 1978 Senior Kindergarten non-thrivers whose status changed to average in 1980 did not have as high ratings on approach, withdrawal adaptability, persistence, and positive mood, nor as low ratings on distractibility and activity, as did children who were consistently average in both years. While they were significantly different from consistent non-thrivers, they were not the same as 1978 average children.

Junior Kindergarten children had the same trends on measures relating to persistence, distractibility, and activity, but not on measures relating to new situations or mood.

Self-confidence. Interestingly, 1978 self-confidence ratings, which appear similar to some temperament ratings, did not predict children who changed thrive status, although they were strongly related to 1978 thrive status (see chapter 5) and 1980 self-confidence ratings were associated with changes in thrive status. This indicates that self-confidence may be more subject to immediate influences than are temperamental characteristics.

Self-direction. The only direct data on self-direction available for 1978 children were the tester-rated CIRCUS Behavior Inventory items concerning self-directedness in the test situation. These did predict Senior Kindergarten children's changes in thrive status from non-thriving to average. (See Table 6-11.) As with the temperament ratings, non-thrivers who became average had higher scores than consistent non-thrivers and lower scores than those who were consistently average.

Table 6-10

Mean Kindergarten Temperament Ratings

by 1978 and 1980 Thrive Status

1980	Non-Thrive	Average			Thrive	
1978	Non-Thrive	Non-Thrive	Avg.	Thrive	Avg.	Thrive
N						
JK	6	9	7	3	10	13
SK	11	16	21	11	21	36
Approach/ Withdrawal						
JK	3.5	3.1	4.5	6.3	4.9	5.6
SK	2.9	3.6	5.1	5.7	4.6	5.7
Adaptability						
JK	4.2	3.9	5.7	6.8	5.9	5.9
SK	3.6	4.6	5.6	6.0	5.6	6.4
Persistence						
JK	3.3	3.4	4.4	4.3	4.8	5.2
SK	2.2	3.4	4.2	4.7	4.4	5.3
Distractibility						
JK	5.8	4.8	3.8	3.0	2.7	2.4
SK	6.4	4.9	3.6	2.6	3.7	2.4
Activity						
JK	4.6	4.3	3.0	1.8	1.5	1.9
SK	5.3	4.1	2.9	2.8	2.7	1.9
Positive Mood						
JK	5.5	4.7	6.1	6.8	6.2	6.3
SK	4.8	5.5	6.0	6.0	6.1	6.4
Negative Mood						
JK	3.0	3.4	2.9	1.8	2.4	1.9
SK	3.5	3.6	2.6	2.7	2.9	2.9

TABLE 6-11

Mean Tester rated "Test Strategy" Scores[a]

by 1978 and 1980 Thrive Status

1980	Non-thriving	Average			Thriving	
1978	Non-thriving	Non-thriving	Avg.	Thriving	Avg.	Thriving
N						
JK	6	10	8	3	14	17
SK	13	21	24	11	25	42
Test Strategy[b]						
JK	1.8	2.0	2.3	2.4	2.7	2.7
SK	2.3	2.6	2.9	3.0	2.9	3.0

a. Combines ratings for "keeping place", "not answering randomly", and "considering answers carefully".

b. Scale ranges from 1.0 to 3.0.

Summary. Although nearly all the measures reported in this study were associated with 1978 thrive status (chapter 5) and perceived changes in thrive status in 1980 (previous section of this chapter), only a few measures taken in 1978 clearly identified those children whose thrive status changed from non-thriving in 1978 to average in 1980. For the most part, these were temperament measures involving adaptability to new situations and various aspects of task persistence. In addition, tester ratings of aspects of self-direction in the 1978 test situation also identified 1978 non-thrivers who changed to average in 1980. These predictions were clearer for Senior Kindergarten children than for Junior Kindergarten.

Demographic Charcteristcs and Changes in Children's Thrive Status

Mother's Education. Mother's education was unrelated to either 1978 thrive status or changes in thrive status between 1978 and 1980.

Father's Education. Father's education was also unrelated to 1978 thrive status or changes in status.

Father's Occupation. Father's occupation was unrelated to changes in thrive status in Grade 1. However, it was related to changes from average to thriving status and vice versa in Grade 2. (See Table 6-12.)

Table 6-12
Mean Ratings[a] for Father's Occupation
by 1978 and 1980 Thrive Status

1980	Non-thriving	Average			Thriving	
1978	Non-thriving	Non-thriving	Avg.	Thriving	Avg.	Thriving
N						
Grade 1	6	10	8	3	14	16
Grade 2	12	21	22	11	25	42
Father's Occupation						
Grade 1	4.8	2.4	4.4	4.7	3.2	4.3
Grade 2	3.3	2.5	3.8	3.1	5.0	4.7

a. Scale: 1 - unskilled; 2 - farmer; 3 - clerical, skilled, technical; 4 - business, white collar self-employed; 5 - professional.

Changes in Thrive Status - Summary

A substantial number of children were perceived by their 1980 teachers to have changed thrive status after 1978. Examination of 1980 measures indicated that these perceived changes were reflected in test scores as well as in teacher and test ratings. The majority of changes were in the direction of improved status and functioning.

Examination of kindergarten measures to determine predictors of changes in thrive status indicated that only temperament ratings and tester ratings of self-direction in the test situation identified 1978 non-thrivers who changed status to average in 1980. The clearest predictions were for the Senior Kindergarten/Grade 2 cohort. Consistent non-thrivers in Grade 2 were also significantly younger than other second graders. The only predictor of changes between average and thriving status was father's occupation.

7 Concurrent Relationships Between Measures

This chapter concerns correlations and multi-variate relationships between measures taken at the same time, either during Kindergarten or in Grades 1 and 2. We will examine relation ships between language and academic measures, social skills, temperament, and self-confidence and direction and the effects of thrive ratings and parent education and occupation.

Thrive Ratings

Table 7-1 shows correlations between 1978 and 1980 thrive ratings and their correlations with the three demographic variables that will be used in this chapter: mother's education, father's education, and father's occupation.

Table 7-1
Correlations Between Kindergarten and Grade 1 and 2 Thrive Ratings and Demographic Variables

		Thrive Rating 1978	Thrive Rating 1980	Mother's Educ.	Father's Educ.	Father's Occup.
Thrive 1978	JK		.40	-.05	-.15	-.11
	SK		.67	-.16	-.22	-.08
Thrive 1980	Gr.1	.40		.16	.02	.07
	Gr.2	.67		.14	.33	.12

Table 7-1 shows that there were substantial but far from perfect relationships between 1978 and 1980 thrive ratings in both cohorts. This table also shows that neither 1978 nor 1980 thrive ratings were strongly related to the three demographic variables.

This information is given as background for the rest of the chapter, since we will be comparing the relationship between each variable and thrive ratings.

Language, Academic Skills, and Demographic Variables

Language. Tables 7-2 and 7-3 show correlations between language indices of vocabulary and functional language or productive grammar skills, and with thrive ratings and the three demographic variables.

These tables show moderate relationships (r = .4 to .5) between vocabulary and functional language in all grades except Senior Kindergarten, and similar relationships between language measures and 1978 thrive ratings, except in Junior Kindergarten. Somewhat lower correlations were found between both 1978 and 1980 language measures and 1980 thrive ratings (r's between .26 and .41). This suggests that the language skills assessed may have played a smaller role in Grade 1 and 2 teachers' perceptions of thrive status. No meaningful relationship existed between any language measure and the demographic variables.

Academic Skills. Tables 7-4 and 7-5 show correlations between academic skills assessed in Kindergarten and Grades 1 and 2, and with thrive ratings and demographic variables.

Table 7-2
Correlations Between Kindergarten
Language Measures,[a] Thrive Ratings,
and Demographic Variables

	Pennies Test	Func. Lang.	Thrive Rating 1978	Thrive Rating 1980	Mother's Educ.	Father's Educ.	Father's Occup.
Pennies Test							
JK		.45	-.14	-.16	.08	-.06	.04
SK		.28	-.18	-.15	.03	.03	.00
Functional Language							
JK	.45		-.42	-.16	.14	.15	.04
SK	.28		-.39	-.31	.26	.29	.27

a. Note that the CIRCUS Say and Tell Pennies Test is only a rough index of vocabulary.

Table 7-3
Correlations Between Grade 1 and 2
Language Measures, Thrive Ratings,
and Demographic Variables

	Vocabu-lary	Func. Lang.	Thrive Rating 1978	Thrive Rating 1980	Mother's Educ.	Father's Educ.	Father's Occup.
Vocabulary							
Grade 1		.44	-.56	-.34	.15	.15	.10
Grade 2		.53	-.44	-.41	.17	.23	.16
Functional Language							
Grade 1	.47		-.51	-.26	.10	.14	.03
Grade 2	.53		-.53	-.41	.17	.23	.09

Table 7-4
Correlations Between Kindergarten
Academic Skills, Thrive Ratings,
and Demographic Variables

	Math. Skills	Number Recog.	Letter Recog.	Thrive Rating 1978	Thrive Rating 1980	Mother's Educ.	Father's Educ.	Father's Occup.
Math. Skills								
JK		.51	.60	-.52	-.40	.10	.09	.03
SK		.41	.60	-.54	-.57	.18	.23	.09
Number Recog.								
JK	.51		.54	-.29	-.33	.14	.23	.12
SK	.41		.42	-.40	-.46	.12	.12	.05
Letter Recog.								
JK	.60	.54		-.51	-.47	.16	.05	.16
SK	.60	.42		-.46	-.47	.21	.32	.18

Table 7-5
Correlations Between Grade 1 and 2
Academic Skills, Thrive Ratings,
and Demographic Variables

	Math. Comput.	word Knowl.	Letter Time	Text Time	Thrive Rating 1978	Thrive Rating 1980	Moth-er's Educ.	Fath-er's Educ.	Fath-er's Educ.
Math. Comput.									
Grade 1		.26	-.51	-.41	-.09	-.15	.16	.00	.08
Grade 2		.65	-.40	-.50	-.60	-.56	.12	.14	.00
Word Knowledge									
Grade 1	.26		-.59	-.70	-.43	-.61	-.04	-.01	-.13
Grade 2	.65		-.49	-.68	-.16	-.61	.11	.28	.12
Letter Time									
Grade 1	-.51	-.59		-.49	.30	.46	-.23	-.13	-.10
Grade 2	-.40	-.49		-.73	.50	.45	-.12	-.20	-.12
Text Time									
Grade 1	-.41	-.70	-.49		.29	.59	-.01	.16	.20
Grade 2	-.50	-.68	-.73		.62	.59	-.16	-.17	-.04

These tables show moderate to substantial concurrent correlations between academic skills in both Kindergarten and Grades 1 and 2, with the exception of mathematics computation and word knowledge in Grade 1. Correlations between thrive ratings and kindergarten academic skills are moderate except for number recognition in Junior Kindergarten. Correlations between 1978 thrive ratings and Grade 1 and 2 academic skills vary considerably. As usual, there were no meaningful correlations between demographic variables and academic skill measures.

Relationships Between Language and Academic Skill Measures. Tables 7-6 and 7-7 show correlations between language and academic skill measures. These tables indicate moderate to substantial correlations between kindergarten mathematics skills and language tests (except for the Pennies vocabulary test in Senior Kindergarten). Letter and number recognition were not strongly related to language tests. Vocabulary skills were moderately related to reading tests in grade 2, while functional language tests were more strongly related to reading tests in Grade 2 than in Grade 1. Neither language test was meaningfully related to mathematics computation in Grades 1 or 2.

Table 7-6

Correlations Between Language and

Academic Skill Measures in Kindergarten

	Mathematics Skills	Number Recognition	Letter Recognition
Pennies			
JK	.46	.17	.21
SK	.24	.05	.17
Func. Lang.			
JK	.66	.36	.34
SK	.48	.29	.34

Table 7-7

Correlations Between Language and

Academic Skills Measures in Grades 1 and 2

	Math. Comput.	Word Knowledge	Letter Times	Text Times
Vocabulary				
Grade 1	.17	.32	-.22	-.09
Grade 2	.34	.48	-.43	-.34
Func. Lang.				
Grade 1	.20	.38	-.12	-.31
Grade 2	-.14	.54	-.41	-.51

Social Skills, Temperament, and Self-confidence and direction

Social Skills. Table 7-8 shows correlations between social skills in Kindergarten and Grades 1 and 2, and with thrive ratings and demographic variables.

Table 7-8
Correlations Between Social Skills Ratings,
Thrive Ratings, and Demographic
Variables in all Grades

	Peer Skills	Adult Skills	Adult-led Group Skills	Empathy	Thrive Ratings 1978	Thrive Ratings 1980	Mother's Educ.	Father's Educ.	Father's Occup.
Peer Skills									
JK		.65	.59	.50	-.51	-.28	.02	.14	.13
SK		.71	.60	.61	-.45	-.28	.03	.13	-.03
Gr. 1		.75	.66	.75	-.13	-.51	.19	.28	.17
Gr. 2		.72	.73	.67	-.47	-.50	.02	.20	.10
Adult Skills									
JK	.65		.57	.46	-.46	-.27	-.02	.15	.13
SK	.71		.40	.43	-.21	-.17	.01	.17	-.03
Gr. 1	.75		.45	.62	.18	-.19	.35	.28	.14
Gr. 2	.75		.49	.57	-.32	-.34	-.07	.09	.10
Adult-led Group Skills									
JK	.59	.57		.49	-.62	-.47	.09	.22	.03
SK	.60	.40		.59	-.56	-.47	.19	.34	.12
Gr. 1	.66	.45		.58	-.22	-.63	.01	.18	.14
Gr. 2	.73	.49		.72	-.65	-.63	.09	.20	.02
Empathy									
JK	.50	.46	.49		-.52	-.40	-.05	.06	.14
SK	.61	.43	.59		-.52	-.40	.01	.19	-.05
Gr. 1	.75	.62	.58		-.02	-.47	.12	.16	.10
Gr. 2	.67	.57	.72		-.51	-.48	.18	.28	.16

Substantial to very substantial correlations (r = .5 to .7) were found between most social skills. Adult skills were less strongly related to adult led group and empathy skills than were peer skills. Adult led group skills were substantially correlated with thrive ratings from the same year, as were Grade 2 adult led group skills with Senior Kindergarten thrive ratings.

There were no meaningful correlations between social skills and demographic variables.

Temperament Ratings. Table 7-9 shows correlations between ratings, thrive ratings, and demographic variables. Relationships between temperament variables are shown in Table 7-10. Table 7-9 shows that, in all grades, all temperament scales except threshold of response and intensity of reactions (and activity and distractibility in Grade 1) were moderately or substantially correlated with concurrent thrive ratings (1978 for JK and SK, and 1980 for Grades 1 and 2). There were no meaningful correlations with demographic variables.

Examination of Table 7-10 suggests several clusters of groups of highly correlated temperament scales. One group includes approach/withdrawal, positive mood, and adaptability. A second group includes persistence, distractibility, and activity level. These variables are also substantially correlated with adaptability. It is interesting to note that they are also substantially correlated with negative mood, especially in Grade 2. Of the remaining two scales, threshold has little stable relationship to the other scales, while intensity is moderately related to both approach/withdrawal and negative mood. For the most part, these concurrent relationships appear to be quite similar in all four grades and both cohorts studied.

Table 7-9

Temperament Ratings

by Thrive and Demographic Variables

	Thrive Rating 1978	Thrive Rating 1980	Mother's Education	Father's Education	Father's Occupation
Approach/ Withdrawal					
JK	-.51	-.29	-.06	.09	.16
SK	-.57	-.41	.07	.23	.15
Gr. 1	-.30	-.51	-.01	.09	-.03
Gr. 2	-.44	-.41	.02	.09	-.07
Adaptability					
JK	-.50	-.30	-.10	.01	.18
SK	-.60	-.52	.20	.24	.14
Gr. 1	-.65	-.42	-.01	.22	.08
Gr. 2	-.57	-.65	.02	.20	.02
Persistence					
JK	-.47	-.37	.00	.13	-.04
SK	-.67	-.64	.08	.26	.18
Gr. 1	-.22	-.65	-.05	.01	-.06
Gr. 2	-.55	-.67	.09	.22	.08
Distractibility					
JK	.61	.65	.05	.11	.07
SK	.69	.56	-.08	-.23	-.11
Gr. 1	.46	.16	.08	-.09	.02
Gr. 2	.48	.58	-.18	-.26	-.10
Activity Level					
JK	.54	.61	.16	.13	.28
SK	.55	.53	-.14	-.16	.12
Gr. 1	.65	.28	.13	.05	.14
Gr. 2	.49	.52	-.08	-.17	-.10
Positive Mood					
JK	-.56	-.33	-.02	.23	.22
SK	-.44	-.42	.11	.27	.12
Gr. 1	-.13	-.43	.14	-.04	.02
Gr. 2	-.47	-.48	.06	.04	.12
Negative Mood					
JK	.28	.39	.17	.26	.10
SK	.21	.15	.02	.01	.12
Gr. 1	.24	.45	.03	-.07	-.05
Gr. 2	.35	.43	-.02	-.13	.02
Threshold					
JK	-.01	-.23	.13	.10	.21
SK	-.18	-.28	.14	.24	.15
Gr. 1	.18	.19	.29	.21	.02
Gr. 2	-.07	.03	.04	.00	.04
Intensity					
JK	-.19	.10	.24	.33	.19
SK	-.09	-.06	.10	.18	.06
Gr. 1	.08	.08	.16	.17	.09
Gr. 2	.14	.14	.06	.07	.03

Table 7-10

Correlations Between Temperament Ratings in All Grades

	Approach/ Withdrawal	Adapta- bility	Persis- tence	Distracti- bility	Activity Level	Positive Mood	Negative Mood	Threshold	Intensity
Approach/ Withdrawal									
JK		.79	.32	-.34	-.27	.75	-.05	-.02	.48
SK		.63	.48	-.47	-.37	.67	-.15	.32	.42
Gr. 1		.67	.34	-.33	-.22	.62	-.08	.45	.48
Gr. 2		.47	.35	-.40	-.09	.54	-.11	.17	.33
Adaptability									
JK	.79		.25	-.41	-.29	.75	-.27	-.02	.32
SK	.63		.57	-.66	-.60	.64	-.32	.26	.15
Gr. 1	.67		.55	-.53	-.49	.37	-.31	.27	.16
Gr. 2	.47		.73	-.64	-.62	.58	-.59	-.08	.19
Persistence									
JK	.31	.25		-.61	-.57	.30	-.04	-.06	.10
SK	.48	.57		-.79	-.69	.44	-.13	.26	.10
Gr. 1	.34	.55		-.61	-.79	.38	-.39	.22	-.33
Gr. 2	.35	.73		-.75	-.83	.55	-.72	.07	-.36
Distractibility									
JK	-.34	-.41	-.61		.85	-.29	.51	.08	.22
SK	-.47	-.66	-.79		.86	-.50	.46	-.14	.07
Gr. 1	-.33	-.53	-.60		.67	-.24	.43	-.32	.03
Gr. 2	-.39	-.64	-.75		.67	-.47	.50	.07	.03
Activity									
JK	-.27	-.29	-.57	.85		-.34	.58	.26	.24
SK	-.37	-.60	-.69	.86		-.48	.58	-.07	.19
Gr. 1	-.22	-.49	-.79	.67		-.35	.58	-.22	.41
Gr. 2	-.08	-.62	-.83	.67		-.54	.75	-.07	.53

Table 7-10 contd.

	Approach/ Withdrawal	Adapta- bility	Persis- tence	Distracti- bility	Activity Level	Positive Mood	Negative Mood	Threshold	Intensity
Approach/ Withdrawal									
JK	.75	.75	.30	-.30	-.34		-.15	.20	.49
SK	.67	.69	.44	-.50	-.48		-.24	.24	.24
Gr. 1	.62	.37	.38	-.24	-.35		-.35	.53	.30
Gr. 2	.54	.59	.55	-.47	-.54		-.40	.22	.09
Negative Mood									
JK	-.05	-.27	-.04	.51	.58	-.15		.36	.52
SK	-.15	-.32	-.13	.46	.58	-.24		.25	.47
Gr. 1	-.08	-.31	-.39	.43	.58	-.35		-.06	.37
Gr. 2	-.11	-.59	-.72	.50	.75	-.40		.19	.55
Threshold									
JK	-.02	-.02	-.06	-.08	.26	.20	.36		.36
SK	.32	.26	.26	-.14	-.07	.24	.25		.35
Gr. 1	.45	.27	.22	-.32	-.22	.53	-.06		-.00
Gr. 2	.17	-.08	.07	-.07	.07	.22	.19		.44
Intensity									
JK	.48	.32	.10	.22	.24	.49	.52	.36	
SK	.42	.15	.10	.07	.19	.24	.47	.35	
Gr. 1	.48	.16	-.22	.03	.41	.30	.38	-.00	
Gr. 2	.33	-.19	-.36	.02	.53	.09	.55	.44	

Self-confidence. Table 7-11 shows correlations between individual self-confidence items, combined scores, thrive ratings, and demographic variables. Inter-item correlations were mostly quite substantial, suggesting that the combined score could be used in relating self-confidence to other variables. Moreover, the combined score was more highly correlated with concurrent thrive ratings than were individual items. As usual, there was no association with demographic variables.

Table 7-11

Correlations Between Self-confidence Items, Thrive Ratings, and Demographic Variables in All Grades

	Try New Task	Response to Failure	General Confid.	Combined Score	Thrive Rating 1978	Thrive Rating 1980	Mother's Educ.	Father's Educ.	Father's Occup.
Try New Task									
JK		.56	.58	.86	-.51	-.45	.18	.16	.27
SK		.59	.74	.89	-.63	-.45	.13	.32	.21
Gr. 1		.54	.71	.83	-.34	-.71	.00	-.04	-.07
Gr. 2		.62	.73	.88	-.58	-.65	.06	.16	.01
Response to Failure									
JK	.56		.45	.80	-.49	-.22	.20	.11	.13
SK	.59		.66	.83	-.58	-.42	.07	.17	-.02
Gr. 1	.54		.71	.88	-.16	-.44	.07	.08	.05
Gr. 2	.62		.72	.88	-.33	-.53	-.01	.03	.04
General Confid.									
JK	.58	.45		.82	-.46	-.44	.16	.21	.14
SK	.74	.66		.92	-.42	-.67	.10	.26	.09
Gr. 1	.71	.71		.92	-.17	-.62	.08	.05	.04
Gr. 2	.73	.72		.91	-.56	-.62	-.01	.00	.02
Combined Score									
JK	.86	.80	.82		-.59	-.45	.21	.20	.22
SK	.89	.83	.92		-.72	-.49	.11	.29	.11
Gr. 1	.83	.88	.92		-.24	-.66	.06	.04	.02
Gr. 2	.88	.88	.91		-.55	-.67	.02	.09	-.02

Self-direction. A teacher-rated self-direction scale was developed for the 1980 study. In addition, testers' ratings of self-direction during testing were available for both 1978 and 1980. Table 7-12 shows correlations between the teacher-rated scale, the tester-rated scale, thrive ratings, and demographic variables. Table 7-13 shows correlations between subscales of the teacher scale and the tester scales.

Table 7-12
Correlations Between Tester-rated
Self-direction, Teacher-rated Self-direction,
Thrive Ratings, and Demographic Variables

	Thrive Rating		Mother's	Father's	Father's
	1978	1980	Education	Education	Occupation
Tester-rated Self-direc.					
JK	-.38	-.49	.11	.00	-.01
SK	-.51	-.49	.14	.20	.13
Gr. 1	-.04	-.33	.05	.07	-.01
Gr. 2	-.41	-.46	.18	.24	.26
Free Time					
Gr. 1	-.30	-.66	-.15	-.07	.05
Gr. 2	-.56	-.70	.07	.05	.16
Classroom Management					
Gr. 1	-.17	-.54	.00	-.20	-.25
Gr. 2	-.43	-.56	.07	.15	.06
Academic Routines					
Gr. 1	-.23	-.74	.08	-.04	-.10
Gr. 2	-.55	-.72	.17	.30	.14
Teacher-set Tasks					
Gr. 1	-.24	-.65	.03	-.07	-.25
Gr. 2	-.55	-.66	.09	.14	.03
Combined Teacher Rating					
Gr. 1	-.29	-.80	-.06	-.13	-.18
Gr. 2	-.61	-.76	.11	.21	.07

Table 7-12 shows very substantial correlations between all sub-scales of the teacher-rated self-direction scale and concurrent (1980) thrive ratings except for the classroom management. This suggests that self-direction is a major element in teachers' thrive judgements. A moderate relationship exists between tester ratings and thrive ratings except in Grade 1. There were no meaningful correlations with demographic variables.

Table 7-13 shows substantial correlations between subscales except for classroom management and free time in Grade 1. This suggests that the combined scale could be used for comparison with other measures.

Table 7-13

Correlations Between Subscales of Self-direction Ratings for Teacher and Tester for Grades 1 and 2

	Tester-rated Self-direc.	Teacher-rated Self-direction				
		Free Time	Classroom Management	Academic Routines	Teacher-set Tasks	Combined Rating
Tester-rated Self-direc.						
Gr. 1		.35	.45	.50	.37	.55
Gr. 2		.46	.34	.37	.35	.47
Free Time						
Gr. 1	.35		.33	.59	.57	.77
Gr. 2	.46		.61	.74	.71	.88
Classroom Management						
Gr. 1	.45	.33		.68	.65	.79
Gr. 2	.34	.61		.67	.73	.86
Academic Routine						
Gr. 1	.50	.59	.68		.70	.89
Gr. 2	.37	.74	.67		.71	.89
Teacher-set Tasks						
Gr. 1	.37	.57	.65	.70		.87
Gr. 2	.35	.71	.73	.71		.89
Combined Teacher Rating						
Gr. 1	.55	.77	.79	.89	.87	
Gr. 2	.47	.88	.86	.89	.89	

Relationships Between Social Skills, Temperament, and Self-confidence and Self-direction. Table 7-14 shows correlations between social skills, temperament, and self-process variables. Careful inspection of this table suggests first that there is considerable similarity in the patterning of correlations across the table for all four grades for a given variable (e.g., peer skills, or teacher-rated self-direction); and secondly that there are two major patterns similar to the two major clusters found in the temperament variables. One pattern, which holds for peer and adult-led group skills and for self-confidence, involves substantial positive correlations with the temperament scales, approach/withdrawal, adaptability, positive mood, and persistence, and moderate to substantial negative correlations with distractibility and activity level. The other pattern, which holds for teacher-rated self-direction and to a lower extent for JK and SK tester-rated self-direction, involves higher correlations with persistence, distractibility, and activity level, and lower correlations with approach/withdrawal and positive mood.

These patterns are clearly related to the original identification of children in the sample as thriving or not thriving. (See 1978 thrive data at the bottom of Table 7-14.) However, in many cases, relationships between measures are larger than correlations of one or both measures with 1978 thrive status.

Relationships Between Language and Academic Skills, and Social Skills, Temperament, and Self-processes

Tables 7-15 and 7-16 show correlations between tested skills and rated social skills, temperament, and self-confidence and self-direction in Kindergarten and Grades 1 and 2 respectively.

Language skills have relatively low correlations with social skills and temperament in all grades.

Academic skills are fairly consistently moderately or substantially correlated with adult-led group skills and with the persistence, distractibility and temperament group in both grades. Adaptability was also substantially correlated with academic skills in Senior Kindergarten and Grades 1 and 2. Consistent with this pattern are moderate correlations with teacher-rated self-direction in Grade 2. Tester-rated self-direction did not correlate highly with most measures in Grades 1 and 2, primarily because there was little variation in the measure (i.e., most children behaved in a controlled or directed way in the test situation). In general, these results indicate that of the two temperamental patterns identified in the last section, both of which are perceived as important by teachers, the pattern relating to concentration and self-direction is more important for academic skills.

Table 7-14

Correlations Between Social Skills, Temperament, Self-confidence, and Self-direction in All Grades.

	Temperament									Self-confidence	Self-direction	
	Appr./ Withdr.	Adapt-ability	Per-sist.	Dis-tract.	Activ-ity	Pos. Mood	Neg. Mood	Thresh-old	Inten-sity		Tester-rated	Teacher-rated
Social Skills												
Peer												
JK	.46	.54	.37	-.54	-.51	.57	-.35	.29	.06	.65	.40	na
SK	.55	.42	.40	-.45	-.40	.59	-.28	.22	.17	.61	.19	na
Gr. 1	.61	.59	.36	-.45	-.35	.65	-.44	.60	.16	.63	.34	.58
Gr. 2	.51	.59	.56	-.50	-.50	.64	-.41	.10	-.10	.52	.35	.62
Adult												
JK	.36	.41	.22	-.38	.50	.52	-.29	.08	.07	.58	.21	na
SK	.43	.15	.15	-.26	-.24	.39	-.22	.11	.18	.34	.11	na
Gr. 1	.32	.20	.22	-.32	-.18	.51	-.26	.62	.08	.37	.17	.21
Gr. 2	.39	.37	.36	-.37	-.32	.54	-.21	.28	.14	.41	.30	.44
Adult-led Group												
JK	.59	.53	.43	-.55	-.65	.71	-.28	-.07	.22	.55	.35	na
SK	.69	.57	.57	-.56	-.52	.72	-.18	.22	.34	.69	.39	na
Gr. 1	.75	.70	.54	-.43	-.47	.60	-.30	.38	.28	.67	.30	.55
Gr. 2	.61	.65	.69	-.58	-.56	.66	-.45	.14	-.04	.64	.36	.69

Table 7-14 (continued)

	Temperament									Self-confidence	Self-direction	
	Appr./ withdr.	Adapt-ability	Per-sist.	Dis-tract.	Activ-ity	Pos. Mood	Neg. Mood	Thresh-old	Inten-sity		Tester-rated	Teacher-rated
Empathy												
JK	.45	.49	.35	-.51	-.54	.38	-.40	-.19	-.03	.47	.36	na
SK	.48	.54	.42	-.60	-.54	.55	-.49	.15	-.02	.59	.37	na
Gr. 1	.30	.39	.37	-.30	-.41	.49	-.48	.53	-.07	.44	.35	.63
Gr. 2	.34	.59	.66	-.55	-.10	.59	-.54	.10	-.18	.51	.34	.62
Self-confidence												
JK	.53	.54	.41	-.58	-.43	.63	-.27	.22	.09		.30	na
SK	.72	.63	.75	-.69	-.57	.65	-.34	.28	.25		.49	na
Gr. 1	.69	.77	.52	-.42	-.46	.48	-.28	.44	.15		.26	.52
Gr. 2	.53	.65	.67	-.59	-.53	.58	-.54	.04	-.10		.36	.72
Self-direction Tester-rated												
JK	.24	.16	.57	-.58	-.49	.19	.00	.07	.16	.30		na
SK	.41	.41	.46	-.48	-.37	.37	-.20	.29	.14	.49		na
Gr. 1	.16	.12	.26	.03	-.28	.29	-.07	.16	.06	.26		.55
Gr. 2	.18	.29	.34	-.38	-.26	.20	-.20	.16	-.05	.36		.47
Teacher-rated												
JK	na	na	na	na	na	na	na	na	na	na	na	
SK	na	na	na	na	na	na	na	na	na	na	na	
Gr. 1	.41	.55	.72	-.49	-.65	.49	-.49	.14	-.15	.52	.55	
Gr. 2	.36	.67	.78	-.74	-.73	.56	-.59	.03	-.24	.72	.47	
Thrive 1978												
JK	-.51	-.50	-.47	.61	.54	-.56	.28	-.01	-.19	-.59	-.38	na
SK	-.57	-.60	-.67	.69	.55	-.44	.21	-.18	-.09	-.72	-.51	na
Gr. 1	-.30	-.65	-.22	.46	.65	-.13	.24	.18	.08	-.29	-.04	-.30
Gr. 2	-.44	-.57	-.55	.48	.49	-.47	.35	-.07	.14	-.55	-.41	-.61

Table 7-15

Relationships Between Language and Academic Skills, and Social Skills, Temperament, and Self-confidence and Self-direction in Kindergarten

	Social Skills				Temperament									Self-confidence	Self-direc. Tester-rated	Thrive 1978
	Peer	Adult	Adult-led Group	Empathy	Appr./Withdraw.	Adaptability	Persist.	Distract.	Activ.	Pos. Mood	Neg. Mood	Thr.	Int.			
Language																
Pennies																
JK	.06	.19	.19	.16	.26	.08	.19	-.05	-.06	.14	.04	-.13	.24	.18	.38	-.14
SK	.05	.06	.18	.10	.05	.03	.07	-.02	.01	.00	.01	.03	.28	.19	.21	-.18
Func. Lang.																
JK	.38	.32	.36	.22	.28	.23	.24	-.21	-.23	.39	-.05	-.07	.15	.39	.39	-.42
SK	.25	.15	.33	.26	.20	.25	.32	-.28	-.22	.21	.02	.08	.12	.29	.43	-.39
Academic Skills																
Math Skills																
JK	.41	.40	.43	.35	.35	.20	.49	-.54	-.51	.34	-.12	.05	.19	.49	.63	-.52
SK	.29	.18	.45	.43	.38	.52	.48	-.48	-.47	.36	-.20	.19	.18	.45	.65	-.54
Number Recog.																
JK	.23	.26	.25	.22	.17	-.01	.41	-.33	-.28	.15	-.07	-.05	.15	.24	.52	-.29
SK	.25	.09	.32	.26	.27	.35	.36	-.34	-.33	.25	-.15	.23	.09	.38	.26	-.40

Table 7-15 (continued)

	Social Skills				Temperament									Self-confidence	Self-direc. Tester-rated	Thrive 1978
	Peer	Adult	Adult-led Group	Empathy	Appr./Withdraw.	Adaptability	Persist.	Distract.	Activ.	Pos. Mood	Neg. Mood	Thr.	Int.			
Academic Skills																
Letter Recog.																
JK	.26	.24	.30	.21	.17	.19	.41	-.47	-.38	.26	-.19	-.03	-.02	.30	.53	-.51
SK	.19	.18	.39	.32	.37	.48	.48	-.43	-.47	.35	-.27	.28	.12	.52	.60	-.46
Thrive 1978																
JK	-.51	-.46	-.62	-.52	-.51	-.50	-.47	.61	.54	-.56	.28	-.01	-.19	-.59	-.38	
SK	-.45	-.21	-.56	-.52	-.57	-.60	-.67	69	.55	-.44	.21	-.18	-.09	-.72	-.51	

Table 7-16

Relationships Between Language and Academic Skills, and

Social skills, Temperament, and Self-confidence and Self-direction in Grades 1 and 2

	Social Skills				Temperament									Self-confidence	Self-direc.		Thrive 1978
	Peer	Adult	Adult-led Group	Empathy	Appr./ Withdrawal	Adaptability	Persist.	Distract.	Activ.	Pos. Mood	Neg. Mood	Thr.	Int.		Tester-rated	Teacher-rated	
Language																	
Vocabulary																	
Gr. 1	.24	.02	.32	.07	.32	.29	.16	-.19	-.20	.21	-.02	.01	.14	.24	.15	.20	-.56
Gr. 2	.25	.23	.33	.33	.27	.32	.30	-.28	-.30	.23	-.19	.14	.02	.35	.39	.36	-.44
Grammar																	
Gr. 1	.30	.15	.28	.17	.25	.33	.24	-.21	-.33	.21	-.26	.13	-.13	.20	.12	.26	-.51
Gr. 2	.20	.07	.38	.30	.25	.29	.33	-.25	-.26	.25	-.19	.13	-.04	.37	.26	.31	-.53
Academic Skills																	
Math. Comp.																	
Gr. 1	.02	.15	.04	-.15	.09	.10	.43	-.23	.09	.04	-.08	.09	-.06	.14	-.22	-.07	-.09
Gr. 2	.17	.02	.46	.31	.37	.46	.46	-.38	-.36	.33	-.29	-.14	-.20	.46	.24	.48	-.60
Word Knowledge																	
Gr. 1	.22	.03	.38	.07	.40	.62	.49	-.37	-.44	.22	-.23	.13	.03	.60	.17	.45	-.43
Gr. 2	.30	.10	.50	.36	.32	.49	.51	-.42	-.41	.36	-.28	-.03	-.18	.51	.35	.48	-.16

Table 7-16 (continued)

	Social Skills				Temperament									Self-confidence	Self-direc.		Thrive 1978
	Peer	Adult	Adult-led Group	Empathy	Appr./ Withdrawal	Adaptability	Persist.	Distract.	Activ.	Pos. Mood	Neg. Mood	Thr.	Int.		Tester-rated	Teacher-rated	
Academic Skills																	
Letter Time																	
Gr. 1	-.23	-.19	-.32	-.09	-.34	-.44	-.38	.31	.27	-.18	.23	-.24	-.02	-.57	-.12	-.25	.30
Gr. 2	-.44	-.31	-.53	-.45	-.28	-.40	-.49	.46	.44	-.39	.35	-.17	.11	-.39	-.33	-.48	.50
Text Time																	
Gr. 1	-.29	-.15	-.38	-.14	-.37	-.56	-.43	.42	.49	-.25	.28	-.33	.06	-.49	.05	-.29	.29
Gr. 2	-.46	-.24	-.59	-.46	-.32	-.53	-.58	.53	.48	-.38	.01	.05	.18	-.56	-.40	-.56	.62
Thrive 1978																	
Gr. 1	-.13	.18	-.22	.02	-.30	-.65	-.22	.46	.65	-.13	.24	.18	.08	-.24	-.04	-.30	
Gr. 2	-.47	-.32	-.65	-.51	-.44	-.57	-.55	.48	.49	-.47	.33	-.07	.14	-.55	-.41	-.61	

Multiple Correlation Analyses

Multiple correlation analysis is a statistical procedure which examines the strength of the relationship between a number of different variables and a specified outcome variable. Based on data already presented in this chapter, the following variables were selected for multiple correlation analyses: vocabulary and functional language measures; mathematics and letter recognition Junior and Senior Kindergarten mathematics, word knowledge, letter times, and text times (Grades 1 and 2); adult-led group skills, adaptability, persistence, activity level, and positive mood; and self-confidence and self-direction.

Language and Skill Measures. Table 7-17 shows multiple correlation values (R) and simple correlations (r) for kindergarten children for whom data on all measures was available. For most measures, other skill measures were the first or most powerful correlate. Tester-rated self-direction was generally the best second correlate. In the case of math skills (How Much and How Many), self-direction either provided the best correlate or added substantially to the initial correlation.

Table 7-18 shows the Grade 1 and 2 skill multiple correlations. Again, the strongest correlates are generally skill variables, with social, temperamental, or self-process variables adding substantially to the multiple correlation of academic skill measures.

The addition of thrive ratings to multiple correlation tables generally did not greatly increase skill multiple correlations in Kindergarten or Grade 1 and 2. This indicates that thrive judgements per se are not associated with variations in skill measures beyond those associated with other tests and ratings.

Social, Temperamental, and Self-confidence and-direction Variables. Tables 7-19 and 7-20 show multiple correlations for these variables. In general, the strongest correlates with these variables are other social, temperamental, and self-process variables. The exception to this is tester-rated self-direction in Kindergarten (strongly associated with math skills). In Grades 1 and 2, various academic skills add substantially to multiple correlations for some temperamental measures and self-confidence.

Concurrent Relationships Between Measures - Summary

Moderate to substantial relationships exist across most measures in the study, except for demographic variables. Skill measures are most strongly correlated with other skill measures, but the concurrent prediction of skill measures can be significantly increased with social, temperamental, or self measures, and vice versa.

Table 7-17

Multiple Correlations and Single Correlations
Between Kindergarten Language
and Academic Skills and Selected Variables

		Mult. Cor.	Mult. Cor. with Thrive added	Academic Skills			Adult-led Group Skills	Temperament				Self-confidence	Tester-rated self-direc.	Thrive 1978
				Func. Lang.	Math. Skills	Letter Recog.		Adaptability	Persistence	Activity Level	Pos. Mood			
Func. Lang.														
JK	R	.70	.71		.66(1)					.70(3)	.68(2)			
	r				.66	.37	.50	.25	.08	-.09	.48	.33	.38	-.48
SK	R	.51	.51		.48(1)		.51(3)						.50(2)	
	r				.48	.28	.25	.24	.31	-.26	.26	.26	.30	-.32
Math Skills														
JK	R	.83	.83	.66(1)		.81(3)				.83(4)			.77(2)	
	r			.66		.60	.52	.20	.34	-.37	.42	.49	.63	-.58
SK	R	.75	.75	.73(3)		.71(2)		.75(4)					.65(1)	
	r			.48		.65	.42	.54	.48	-.51	.44	.43	.65	-.52
Letter Recog.														
JK	R	.63	.67		.60(1)								.63(2)	
	r			.37	.60		.29	.19	.40	-.25	.38	.41	.43	-.51
SK	R	.70	.70							.70(3)		.66(1)	.69(2)	
	r			.28	.60		.48	.52	.52	-.51	.37	.52	.46	-.45

Note: Single correlations between variables are slightly different from those in earlier tables because the sample available for this analysis (35 JK, 86 SK) is smaller due to missing data for some children.

Table 7-18
Multiple and Simple Correlations
Between Grade 1 and 2 Language and
Academic Skills and Selected Variables

		Mult. Cor.	Mult. Cor. with Thrive added	Vocab.	Func. Lang.	Academic Skills: Math. Comp.	Academic Skills: Word Knowl.	Academic Skills: Letter Time	Academic Skills: Text Time	Adult-led Group Skills	Temperament: Adapt.	Temperament: Per-sist.	Temperament: Act. Level	Temperament: Pos. Mood	Self-confi-dence	Teacher rated Self-direc.	Thrive 1978
Vocabulary																	
Gr. 1	R	.53	.66			.49(4)	.32(1)		.45(3)	.39.2)		.53(5)					
	r				.45	.37	.32	-.10	-.03	.45	.42	.09	-.04	.26	.27	.02	-.42
Gr. 2	R	.55	.56				.48(1)	.53(2)	.55(3)								
	r			.54		.30	.48	-.41	-.42	.41	.37	.37	-.34	.29	.46	.40	-.41
Func. Lang.																	
Gr. 1	R	.57	.60	.47(1)				.55(3)	.54(2)				.57(4)				
	r			.47		.42	.25	-.05	-.27	.40	.34	.35	-.33	.30	.11	.28	-.39
Gr. 2	R	.65	.65	.62(2)			.54(1)		.65(3)								
	r			.54		.43	.54	-.40	-.54	.42	.37	.40	-.33	.29	.46	.40	-.53
Math. Comp.																	
Gr.	R	.96	.97					.51(1)	.96(5)			.57(2)	.83(3)			.88(4)	
	r			.37	.42		.54	-.51	-.40	.34	.61	.32	-.14	.14	.35	.29	-.29
Gr. 2	R	.67	.70				.65(1)									.67(2)	
	r			.30	.43		.65	-.30	-.46	.47	.45	.46	-.31	.37	.49	.44	-.57

Table 7-18 (continued)

Multiple and Simple Correlations
Between Grade 1 and 2 Language and
Academic Skills and Selected Variables

		Mult. Cor.	Mult. Cor. with Thrive added	Vocab.	Func. Lang.	Academic Skills				Adult-led Group Skills	Temperament				Self-confidence	Teacher rated Self-direc.	Thrive 1978
						Math. Comp.	Word Knowl.	Letter Time	Text Time		Adapt.	Per-sist.	Act. Level	Pos. Mood			
Word Knowl.																	
Gr. 1	R	.79	.79	.79(3)					.70(1)						.76(2)		
	r			.32	-.24	.54		-.60	-.70	.43	.74	.45	-.32	.32	.54	.39	-.33
Gr. 2	R	.79	.79	.79(3)		.77(2)			.68(1)								
	r			.48	.51	.65		-.38	-.68	.54	.53	.55	-.43	.42	.59	.54	-.61
Letter Time																	
Gr. 1	R	.75	.75			.62(2)	.59(1)										
	r			-.11	-.05	-.34	-.59		.40	-.45	-.58	-.23	-.12	-.19	.75(3) .52	.38	.31
Gr. 2	R	.73	.73	.73(2)					.70(1)								
	r			-.41	-.39	-.30	-.38		.73	-.56	-.40	-.47	.43	-.38	-.45	-.48	.46
Text Time																	
Gr. 1	R	.93	.93	.93(5)		.74(2	.70(1)					.88(4)	.78(3)				
	r			-.04	-.27	-.40	-.70	.48		-.35	-.56	-.40	.46	-.27	-.46	-.33	.24
Gr. 2	R	.80	.80				-.80(2)	.70									
	r			-.42	-.54	-.46	-.68	.70		-.63	-.53	-.60	.50	-.43	-.59	-.59	.63

Table 7-19

Multiple Correlations and Single Correlations

Between Kindergarten Social, Temperamental,

and Self-Process Variables and Selected Skill Variables

	Mult. Cor.	Mult. Cor. with Thr.	Func. Lang.	Academic Skills		Adult-led Group Skills	Temperament				Self-processes		Thrive 1978
				Math Skills	Letter Recog.		Adapta-bility	Persis-tence	Activity Level	Pos. Mood	Self-confi-dence	Tester-rated Self-dir.	
Adult-led Group Skills													
JK R	.84	.84							.84(2)	.71(1)			
r			.50	.52	.29		.50	.17	.65	.71	.57	.38	-.61
SK R	.80	.80						.80(3)		.72(1)	.78(2)		
r			.25	.42	.48		.59	.55	-.50	.72	.71	.33	-.55
Adapta-bility													
JK R	.75	.75								.75(1)			
r			.25	.20	.19	.50		.13	-.19	.75	.61	.15	-.60
SK R	.80	.80							.78(2)	.80(3)	.77(1)		
r			.24	.54	.52	.59		.62	-.61	.66	.77	.46	-.60
Persis-tence													
JK R	.68	.68							.66(2)		.68(3)	.57(1)	
r			.07	.34	.90	.17	.13		-.28	.16	.47	.50	-.33
SK R	.75	.77							.68(1)		.75(2)		
r			.31	.48	.52	.55	.61		-.68	.44	.63	.36	-.66

Table 7-19 (continued)

	Mult. Cor.	Mult. Cor. with Thr.	Func. Lang.	Academic Skills		Adult-led Group Skills	Temperament				Self-processes		Thrive 1978
				Math Skills	Letter Recog.		Adapta-bility	Persis-tence	Activity Level	Pos. Mood	Self-confi-dence	Tester-rated Self-dir.	
Activity Level													
JK R	.75	.75				.65(1)		.73(2)		.75(3)			
r			-.09	-.37	-.25	.65	-.19	-.28		-.30	-.45	-.25	.44
SK R	.73	.73					.73(2)	.68(1)					
r			-.26	-.51	-.51	-.50	-.61	-.68		-.48	-.54	-.35	.54
Pos. Mood													
JK R	.84	.85				.84(2)	.75(1)						
r			.48	.42	.38	.71	.75	.16	-.30		.63	.27	-.67
SK R	.77	.78				.72(1)	.77(2)						
r			.26	.44	.33	.72	.66	.44	-.48		.62	.41	-.39
Self-Confid.													
JK R	.69	.69		.68(2)						.63(1)			
r			.33	.49	.41	.57	.61	.47	-.45	.63		.45	-.55
SK R	.83	.85				.81(2)	.77(1)	.83(3)					
r			.26	.43	.52	.71	.77	.63	-.53	.62		.40	-.67
Tester-Self-Direc.													
JK R	.70	.70		.63(1)				.70(2)					
r			.38	.63	.43	.38	.15	.50	-.25	.27	.45		-.37
SK R	.69	.69		.65(1)							.69(2)		
r			.30	.65	.46	.33	.46	.36	-.35	.41	.40		-.41

See note on Table 7-17

Table 7-20

Multiple and Simple Correlations

Between Grade 1 and 2 Social, Temperamental,

and Self-process variables and Selected Skill Variables

		Mult. Cor.	Mult. Cor. with Thr.	Vo-cab.	Func. Lang.	Academic Skills: Math. Comp.	Word Knowl.	Letter Recog.	Text Time	Adult-led Group Skills	Temperament: Adapt.	Per-sist.	Act-iv.	Pos. Mood	Self-process: Self-confid.	Self-direc.	Thrive 1978
Adult-led Group Skills																	
Gr. 1	R	.81	.81								.70(1)	.81(3)		.79(2)			
	r			.45	.40	.34	.43	-.46	-.35		.70	.86	-.36	.55	.68	.50	-.18
Gr. 2	R	.69	.83								.66(1)	.69(2)					
	r			.41	.42	.47	.54	-.56	-.63		.66	.66	-.51	.66	.53	.62	-.65
Adapta-bility																	
Gr. 1	R	.83	.84				.83(3)			.81(2)					.77(1)		
	r			.42	.34	.61	.74	-.58	-.55	.70		.51	-.38	.27	.70	.56	-.38
Gr. 2	R	.78	.79									.73(1)		.76(2)	.78(3)		
	r			.40	.37	.45	.53	-.40	-.53	.66		.72	-.60	.65	.68	.66	-.58
Persis-tence																	
Gr. 1	R	.97	.97			.84(2)			.97(4)				.79(1)			.93(3)	
	r			.09	.34	.32	.45	-.22	-.40	.46	.52		-.79	.33	.39	.67	-.28
Gr. 2	R	.89	.89							.89(3)			.83(1)		.88(2)		
	r			.37	.41	.45	.55	-.47	-.60	.69	.72		-.83	.56	.69	.77	-.54
Activity Level																	
Gr. 1	R	.99	.99	.99(5)		.81(2)			.89(3)			.79(1)				.95(4)	
	r			-.04	-.33	-.14	-.32	.12	.46	-.36	-.38	-.79		-.29	-.17	-.55	.19
Gr. 2	R	.85	.85									.83(1)			.85(3)	.84(2)	
	r			-.35	-.34	-.31	-.43	.43	.50	-.58	-.60	-.83		-.50	-.56	-.72	.47

Table 7-20 (continued)

		Mult. Cor.	Mult. Cor. with Thr.	Vo-cab.	Func. Lang.	Academic Skills				Adult-led Group Skills	Temperament				Self-process		Thrive 1978
						Math. Comp.	Word Knowl.	Letter Recog.	Text Time		Adapt.	Per-sist.	Act-iv.	Pos. Mood	Self-confid.	Self-direc.	
Pos. Mood																	
Gr. 1	R	.70	.70				.70(4)			.55(1)	.64(2)	.67(3)					
	r			.26	.30	.14	.32	-.19	-.27	.55	.27	.33	-.29		.44	.42	-.13
Gr. 2	R	.78	.78							.72(1)	.75(2)				.78(4)		
	r			.36	.29	.37	.42	-.38	-.43	.72	.65	.56	-.50		.62	.60	-.53
Self-Confid.																	
Gr. 1	R	.84	.84				.84(3)		.81(2)		.77(1)						
	r			.27	.11	.35	.54	-.53	-.46	.68	.77	.39	-.17	.44		.47	-.11
Gr. 2	R	.76	.76						.76(3)		.75(2)					.73(1)	
	r			.46	.46	.49	.58	-.45	-.59	.66	.68	.69	-.56	.62		.73	-.60
Self-Direc.																	
Gr. 1	R	.95	.95			.84(2)			.95(4)			.72(1)	.91(3)				
	r			.02	.28	.29	.39	-.38	-.33	.50	.56	.72	-.55	.42	.47		-.31
Gr. 2	R	.84	.84									.78(1)	.84(3)		.82(2)		
	r			.45	.40	.44	.54	-.48	-.59	.74	.66	.78	-.72	.60	.73		-.61

8 Relationships Between Kindergarten Measures and Grade 1 and 2 Measures

In the preceding chapter, concurrent relationships between language and academic skill measures, and social skill, temperament, and self-process ratings were examined. In this chapter, longitudinal relationships between Junior Kindergarten and Grade 1 measures, and Senior Kindergarten and Grade 2 measures, will be examined.

Predicting Language and Academic Skills in Grades 1 and 2

Predictions from Language and Academic Skills in 1978. Table 8-1 shows correlations between 1978 and 1980 language and academic skills. Grade 1 and 2 vocabulary and functional language skills are moderately correlated with kindergarten functional language, math skills, and letter recognition skills.

Grade 1 and 2 academic skills are not meaningfully correlated with kindergarten language skills except for Grade 2 word knowledge. Grade 2 mathematics computation, and text reading times, and Grade 1 and 2 word knowledge skills, are moderately correlated with kindergarten math skills and letter recognition. The effectiveness of math skills as a predictor may reflect not only content but also general intellectual maturity.

Predictions from Social, Temperamental, and Self-process Variables. Table 8-2 shows correlations between these variables. Grade 1 and 2 functional language and Grade 1 vocabulary skills are moderately correlated with kindergarten peer and adult-led group skills, as well as kindergarten self-confidence ratings. The effects of temperament on functional language vary somewhat between Grades 1 and 2, but generally are related to the persistence-distractibility-activity temperament cluster. Grade 2 vocabulary is also related to self-confidence ratings and tester-rated self-direction.

Grade 2 mathematics computation skills are moderately to substantially related to the persistence cluster of temperament ratings, as well as to adaptability, approach/withdrawal, and self-confidence and tester-rated self-direction.

Grade 1 and 2 reading skills (word knowledge and text time) are moderately to substantially correlated with adult-led group skills, and distractibility and activity level. For Grade 2 only, there are also moderate to substantial correlations for reading skills (including letter times) with adaptability, self-confidence, and tester-rated self-direction.

Predicting Social, Temperamental, and Self-process Variables in Grades 1 and 2

Predictions from Social, Temperamental, and Self-process Variables. Table 8-3 shows correlations between kindergarten social, temperamental, and self-process variables and Grade 1 and 2 social skills and self-process variables. Table 8-4 shows correlations between the kindergarten variables and Grade 1 and 2 temperament ratings.

Table 8-1

Correlations Between 1978 and 1980 Skill Measures

1980 Measures	1978 Measures				
	Pennies Test	Func. Lang.	Math Skills	Number Recog.	Letter Recog.
Language					
Vocabulary					
Gr. 1	.22	.42	.57	.41	.43
Gr. 2	.25	.46	.50	.24	.42
Func. Lang.					
Gr. 1	.19	.49	.46	.19	.23
Gr. 2	.28	.48	.50	.31	.44
Academic Skills					
Math. Comp.					
Gr. 1	-.05	.07	.06	.21	.17
Gr. 2	.10	.27	.51	.24	.40
Word Knowl.					
Gr. 1	.07	.30	.44	.27	.38
Gr. 2	.07	.42	.56	.35	.50
Letter Time					
Gr. 1	-.10	-.21	-.21	-.25	-.40
Gr. 2	-.17	-.30	-.31	-.22	-.32
Text Time					
Gr. 1	.11	-.08	-.20	-.14	-.27
Gr. 2	-.13	-.25	-.45	-.37	-.44

Table 8-2

Grade 1 and 2 Skills by Kindergarten

Social, Temperamental, and Self-processes Variables

1980 Skills	1978 Social Skills				1978 Temperament									1978 Self-processes	
	Peer	Adult	Adult-led Group	Empathy	Appr./ Withdraw.	Adapt.	Persist.	Distract.	Activ.	Pos. Mood	Neg. Mood	Thr.	Int.	Self-Confid.	Tester-Rated Self-Direct.
Language															
Vocab.															
Gr. 1	.29	.37	.54	.46	.32	.33	.34	-.45	-.43	.38	-.16	-.11	.23	.43	.47
Gr. 2	.23	.20	.28	.26	.27	.32	.33	-.33	-.28	.23	.04	.24	.26	.40	.44
Func. Lang.															
Gr. 1	.45	.58	.56	.42	.25	.26	.28	-.43	-.61	.33	-.43	-.16	-.14	.43	.18
Gr. 2	.42	.25	.38	.37	.35	.43	.44	-.38	-.34	.28	-.13	.17	.09	.47	.39
Academic Skills															
Math. Comput.															
Gr. 1	.09	.16	.23	.13	.08	.24	.14	-.04	-.08	.23	-.41	-.26	.00	.09	.03
Gr. 2	.20	.04	.34	.41	.41	.48	.44	-.47	-.57	.37	-.24	.12	-.08	.47	.43
Word Knowl.															
Gr. 1	.33	.30	.51	.23	.27	.29	.29	-.50	-.46	.30	-.28	-.13	-.04	.37	.31
Gr. 2	.30	.17	.46	.54	.38	.53	.51	-.48	-.46	.41	-.22	.12	.03	.54	.45

Table 8-2 (continued)

1980 Skills	1978 Social Skills				1978 Temperament									1978 Self-processes	
	Peer	Adult	Adult-led Group	Empa-thy-led	Appr. With-draw.	Adapt.	Per-sist.	Dis-tract.	Act-iv.	Pos. Mood	Neg. Mood	Thr.	Int.	Self-Confid.	Tester-Rated Self-Direct.
Academic Skills															
Letter															
Gr. 1	-.15	-.13	-.34	-.16	-.21	-.29	-.24	.32	.29	-.31	.22	.07	-.10	-.39	-.39
Gr. 2	-.28	-.16	-.42	-.39	-.28	-.46	-.35	.52	.51	-.35	.32	-.18	.04	-.50	-.43
Text Time															
Gr. 1	-.14	-.20	-.40	-.09	-.11	-.10	.16	.48	.56	-.15	.52	.30	.24	-.01	-.06
Gr. 2	-.28	-.05	-.55	-.49	-.37	-.53	-.54	.53	.51	-.35	.26	-.23	.05	-.49	-.35

Table 8-3

Grade 1 and 2 Social Skills and Self-processes

by Kindergarten Social Skills, Temperament, and Self-processes

1980 Variables	1978 Social Skills				1978 Temperament									Self-processes	
	Peer	Adult	Adult-led Group	Empathy	Appr. With draw.	Adapt.	Persist.	Distract.	Activ.	Pos. Mood	Neg. Mood	Thr.	Int.	Self-Confid.	Tester-rated Self-direc.
Social Skills															
Peer															
Gr. 1	.25	.17	.24	.00	.22	.10	.18	-.23	-.17	.24	.00	.08	.14	.28	.32
Gr. 2	.37	.24	.39	.34	.37	.35	.53	-.44	-.36	.34	.03	.46	.10	.41	.28
Adult															
Gr. 1	.01	-.02	.05	-.21	-.02	-.13	-.04	-.07	.07	.10	.08	.17	.15	.06	.08
Gr. 2	.23	.21	.31	.25	.31	.25	.39	-.34	-.28	.20	.07	.20	.18	.23	.18
Adult-led Group															
Gr. 1	.28	.21	.31	.24	.39	.31	.13	-.28	-.22	.25	-.09	.26	.05	.39	.31
Gr. 2	.23	.21	.31	.26	.31	.25	.39	-.34	-.28	.20	.07	.20	.18	.23	.18
Empathy															
Gr. 1	.22	.18	.10	-.10	-.03	-.11	.22	-.23	-.22	.05	.04	.25	.05	.15	.32
Gr. 2	.25	.23	.33	.32	.29	.25	.43	-.44	-.40	.21	-.13	.23	.02	.43	.35

Table 8-3 (continued)

1980 Variables	1978 Social Skills					1978 Temperament								1978 Self-processes	
	Peer	Adult	Adult-led Group	Empathy-led	Appr. Withdraw.	Adapt.	Persist.	Distract	Activ.	Pos. Mood	Neg. Mood	Thr.	Int.	Self-Confid.	Tester-rated Self-direc.
Self-processes															
Self-confidence															
Gr. 1	.24	.19	.39	.08	.27	.20	.21	-.40	-.33	.23	-.07	-.11	.07	.39	.48
Gr. 2	.25	.17	.35	.33	.29	.37	.45	-.42	-.35	.27	.21	.04	-.07	.38	.40
Teacher-rated Self-direction															
Gr. 1	.41	.22	.27	.35	.23	.23	.43	-.64	-.56	.12	-.22	-.01	-.10	.38	.52
Gr. 2	.30	.18	.41	.39	.32	.46	.58	-.56	-.46	.35	-.13	.31	-.07	.51	.39
Tester-rated-Self-direction															
Gr. 1	.14	.10	.14	.13	.08	.06	.22	-.22	-.16	.01	.20	.00	.00	.20	.32
Gr. 2	.17	.04	.26	.16	.19	.42	.42	-.38	-.34	.21	.03	.23	.17	.31	.25

Social skills are for the most part not highly correlated over the two-year period, despite the fact that, as groups, the thriving, average, and non-thriving children differed substantially on these variables in both 1978 and 1980. Only the Grade 2 adult-led group ratings were moderately correlated with 1978 social skills, and even this variable was more highly correlated with several kindergarten temperament ratings. This suggests that social skills are subject to a good deal of change in this period, partly affected by temperamental characteristics and partly by environmental influences. (As we shall see further on in this section, kindergarten skills have little relation to Grade 1 and 2 social skills, with the possible exception of math skills or the general intellectual capacities they index.)

Grade 2 peer and adult-led group skills are substantially related to the persistence-distractibility-activity cluster of temperament variables, and adult-led group skills are also substantially or moderately related to the Approach/withdrawal-adaptability-positive mood cluster. In addition, Grade 2 adult-led group skills are substantially related to self-confidence and related to tester-rated self-direction.

Self-confidence in Grades 1 and 2 is moderately correlated with kindergarten self-confidence, tester-rated self-direction, and distractibility.

Teacher-rated self-direction in Grades 1 and 2 is more substantially correlated with kindergarten variables, including the persistence-distractibility-activity cluster as well as adaptability and self-confidence. More moderate correlations exist between teacher-rated self-direction and tester-rated self-direction and adult-led group and empathy social skills.

Grade 2 tester-rated self-direction is moderately correlated with the persistence cluster in Kindergarten. It is not strongly correlated with other measures.

Table 8-4 shows correlations between Grade 1 and 2 temperament ratings and kindergarten social, temperamental, and self-process variables. A majority of temperament scales (approach/withdrawal, persistence, distractibility, activity, negative mood, and intensity) were more highly correlated with the same characteristic in 1980 in one or both grades than with any other temperamental, social, or self variable. These stabilities ranged from fairly low to substantial, with approach/withdrawal, persistence (SK/Gr. 2), and activity being the most stable.

The persistence-distractibility-activity cluster of temperamental variables identified in the concurrent analyses in chapter 7 holds for the longitudinal data as well, but only for Grade 2. In addition, Senior Kindergarten self-confidence and tester-rated self-direction are related to this cluster in Grade 2. This suggests that while these variables appear to be related in all grades, they have become more stable by Senior Kindergarten than they are in Junior Kindergarten.

There is some evidence for the approach/withdrawal-positive mood cluster as well, since these characteristics in Grades 1 and 2 are more highly correlated with each other in Kindergarten than with other temperamental characteristics.

Grade 1 and 2 adaptability, which is moderately correlated with a large number of variables on a concurrent basis (chapter 7), is more affected by the persistence cluster of characteristics and tester-rated self-direction in Kindergarten than by kindergarten ratings of adaptability.

There are four instances of Grade 1 and 2 temperament ratings being moderately related to kindergarten social skills. In all cases, these hold only for one grade.

Kindergarten self-confidence ratings are moderately related to the Grade 2 persistence cluster as well as to Grade 2 positive mood.

Predictions from Language and Academic Variables. There are almost no meaningful correlations between Kindergarten skills measures and Grade 1 and 2 social, temperamental, and self-process variables. Grade 1 and 2 adaptability and teacher-rated self-direction are moderately correlated (r = around .40) with kindergarten math skills and letter recognition, as is Grade 2 persistence. (See Table C-1 in Appendix C.) Thus it appears that early social, temperamental, and self-process variables play a larger role in later skill development than vice versa.

Multiple Correlation Analysis of Predictions From Kindergarten Variables to Grades 1 and 2

As discussed in chapter 7, multiple correlation is a statistical procedure which permits examination of the combined predictive value of different variables for a given variable.

Predicting Skill Variables. Table 8-5 shows multiple correlations between selected kindergarten variables[1] and Grade 1 and 2 skill measures. Over time, language skills continued to be most strongly associated with earlier skills (except for functional language in Grade 1), while social, temperamental, and self-process variables did not contribute much additional prediction.

Grade 1 and 2 academic skills were more frequently most strongly correlated with kindergarten activity level or kindergarten adult-led group skills. The second predictor was usually a kindergarten skill measure, except for most reading time measures for which second predictors were temperament of self-process measures.

Senior Kindergarten teacher's thrive ratings increased prediction of Grade 2 academic skills significantly.

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1. See chapter 7, section on multiple correlation.

Table 8-4

Grade 1 and 2 Temperament Ratings

by Kindergarten Social Skills, Temperament, and Self-process Variables

1980 Temperament	1978 Social Skills				1978 Temperament									1978 Self-processes	
	Peer	Adult	Adult-led Group	Empathy-led	Appr. Withdraw.	Adapt.	Persist.	Distract.	Activ.	Pos. Mood	Neg. Mood	Thr.	Int.	Self confid.	Tester-rated Self-dir.
Approach Withdrawal															
Gr. 1	.11	.10	.38	.10	.50	.35	.18	-.19	-.17	.31	.07	-.26	.30	.19	.29
Gr. 2	.31	.29	.27	.28	.50	.27	.24	-.22	-.25	.35	-.04	.21	.28	.33	.26
Adaptability															
Gr. 1	.39	.33	.51	.30	.38	.32	.28	-.43	-.49	.29	-.23	-.28	.01	.34	.42
Gr. 2	.24	.15	.32	.38	.40	.35	.49	-.50	-.40	.35	.17	-.07	-.09	.39	.49
Persistence															
Gr. 1	.36	.22	.37	.39	.22	.20	.26	-.49	-.47	.09	-.34	-.24	-.11	.30	.29
Gr. 2	.31	.24	.35	.44	.31	.37	.54	-.53	-.54	.31	.20	-.09	-.09	.49	.43
Distractibility															
Gr. 1	-.18	-.22	-.26	-.11	.18	.16	-.10	.36	.35	-.10	.21	.10	-.07	-.15	-.08
Gr. 2	-.24	-.09	-.39	-.33	-.30	-.33	-.44	.46	.45	-.31	.19	-.24	.03	-.40	-.31
Activity Level															
Gr. 1	-.40	-.40	-.42	-.42	-.20	-.15	-.15	.57	.58	-.15	.30	.02	.17	-.38	-.33
Gr. 2	-.34	-.23	-.34	-.39	-.21	-.34	-.51	.54	.57	-.24	.30	-.23	.23	-.47	-.39

Table 8-4 (continued)

1980 Temperament	1978 Social Skills				1978 Temperament									1978 Self-processes	
	Peer	Adult	Adult-led Group	Empathy-led	Appr./ Withdraw.	Adapt.	Persist.	Distract.	Activ.	Pos. Mood	Neg. Mood	Thr.	Int.	Self-confid.	Tester-Self-rated
Positive Mood															
Gr. 1	.25	.09	.33	.05	.33	.16	.24	-.28	-.19	.29	.09	-.07	.08	.28	.28
Gr. 2	.40	.30	.42	.34	.45	.37	.41	-.39	-.38	.39	-.14	.18	.10	.49	.37
Negative Mood															
Gr. 1	-.47	-.45	-.26	-.22	-.13	-.25	-.14	.48	.41	-.28	.36	-.17	.23	-.44	-.16
Gr. 2	-.22	-.22	-.14	-.30	-.05	-.07	-.26	.30	.31	.08	.32	-.08	.38	-.25	-.35
Threshold															
Gr. 1	-.01	-.01	.07	-.23	-.20	-.42	.26	-.01	.02	-.13	.26	.14	.02	.04	.22
Gr. 2	-.24	.18	.16	.02	.16	.08	.04	-.10	-.07	.20	.10	.02	.30	.12	-.04
Intensity															
Gr. 1	-.30	-.30	.06	-.33	.20	.02	-.10	.40	.31	.10	.55	-.18	.45	-.35	-.03
Gr. 2	.01	-.03	.09	-.14	.18	-.03	-.11	.17	.25	.12	.28	.05	.49	.07	-.16

Table 8-5

Multiple Correlations Between Grade 1 and 2

Skill Measures and Selected Kindergarten Variables

1980 Skills	Mult-Cor.	Mult-Cor. with Thr.	Func. Lang.	Math Skills	Letter Recog.	Adult-led Group Skills	Adapta-bility	Persis-tence	Activity level	Pos. Mood	Self-confid.	Tester-rated Self-direc.
					Kindergarten Variables							
Vocabulary												
Gr. 1	.66	.68		.57(1)		.66(2)						
Gr. 2	.59	.59	.56(2)	.50(1)							.59(3)	
Func. Lang.												
Gr. 1	.76	.77	.71(2)						.62(1)			.76(3)
Gr. 2	.62	.68	.57(2)	.50(1)							.62(3)	
Math. Comput.												
Gr. 1	.31	.33		.29(3)	.27(2)	.31(4)	.24(1)					
Gr. 2	.63	.68		.63(2)					.57(1)			
Word Knowl.												
Gr. 1	.58	.58		.56(2)	.58(3)	.51(1)						
Gr. 2	.66	.69	.66(3)	.56(1)							.64(2)	
Letter Time												
Gr. 1	.57	na		.57(4)	.40(1)						.49(2)	.52(3)
Gr. 2	.60	na							.51(1)		.60(3)	.57(2)
Text Time												
Gr. 1	.84	.84			.84(3)			.81(2)	.56(1)			
Gr. 2	.64	.68				.55(1)	.64(3)	.61(2)				

Predicting Social, Temperamental, and Self-process Variables. Table 8-6 shows multiple correlations between selected kindergarten measures and Grade 1 and 2 adult group skills, temperament, and self-process variables. Table 8-6 shows several consistent patterns. First, with the exception of Grade 1 and 2 adaptability, nearly all kindergarten multiple predictors involve social, temperamental, or self-process variables. Secondly, kindergarten activity level and persistence are the main first correlates. Thirdly, tester-rated self-direction is frequently the best second predictor. (This indicates that test situations may be useful settings for observing children's functioning.) Fourthly, kindergarten adaptability and positive mood provide no significant predictions of Grade 1 or 2 social, temperamental, or self-process variables.

Senior Kindergarten thrive ratings significantly improved predictions of Grade 2 adult-led group skills, adaptability, self-confidence, and self-direction.

Relationships Between Kindergarten Measures and Grade 1 and Grade 2 Measures - Summary

As with concurrent measures, substantial correlations exist between kindergarten measures and Grade 1 and 2 measures. The substantial correlations, and especially multiple correlations demonstrated between Junior Kindergarten measures and Grade 1 measures, indicate that despite the failure of Junior Kindergarten thrive ratings to predict consistently Grade 1 functioning (especially social and temperamental differences), more specific tests and ratings of Junior Kindergarten children can be predictive of Grade 1 functioning. This also indicates that the broad range of relationships reported in this study are not solely due to the initial sample selection procedures.

In general, the finding that kindergarten social, temperamental, and self-variables are relatively better predictors of Grade 1 and 2 academic measures than the reverse (i.e., kindergarten academic measures as predictors of Grade 1 and 2 social, temperamental, and self-variables) indicates the importance of early social and emotional characteristics. This point will be pursued in the next chapter.

Table 8-6

Multiple Correlations Between Selected Grade 1 and 2

Social, Temperamental, and Self-process Variables and Selected Kindergarten Measures

1980 Variables	Mult-Cor.	Mult-Cor. with Thr.	Kindergarten Measures: Func. Lang.	Math. Skills	Letter Recog.	Adult-led Group Skills	Adaptability	Persistence	Activity level	Pos. Mood	Self-confid.	Tester-rated Self-direc.
Adult-led Group												
Gr. 1	.46	.46						.46(3)			.38(1)	.43(2)
Gr. 2	.65	.70							.65(2)		.61(1)	
Adaptability												
Gr. 1	.59	.59			.59(2)	.51(1)						
Gr. 2	.53	.59			.53(2)			.49(1)				
Persistence												
Gr. 1	.56	.56	.52(2)						.47(1)			.56(3)
Gr. 2	.63	.64						.63(3)	.55(1)			.60(2)
Activity												
Gr. 1	.65	.65						.62(2)	.58(1)		.65(3)	
Gr. 2	.60	.61							.57(1)			.60(2)
Pos. Mood												
Gr. 1	.37	.40				.33(1)						.37(2)
Gr. 2	.51	.53									.49(1)	.51(2)
Self-confid.												
Gr. 1	.59	.59				.59(4)		.57(3)			.54	.48(1)
Gr. 2	.50	.57						.45(1)				.50(2)
Teacher-rated Self-dir.												
Gr. 1	.67	.67				.64(3)			.56(1)		.67(4)	.63(2)
Gr. 2	.60	.65						.58(2)			.60(3)	.50(1)

9 Who Thrives in Primary Programs and Why – Conclusions and Implications of This Study

Conclusions

The research reported in this study involved three major questions:

1. Does attending half-day, alternate full-day, or full-day Kindergarten make any difference to children's functioning in a variety of areas (health, language, academic performance, social skills, or emotional functioning) either in Kindergarten (Junior or Senior) or in Grades 1 or 2?

2. What differences characterize children perceived by their kindergarten teachers to be "thriving", "average", or "not thriving" in terms of the teachers' goals both in Kindergarten (Junior or Senior) and in Grades 1 or 2?

3. Among children from Junior Kindergarten to Grade 2, what relationships exist concurrently and longitudinally between demographic characteristics, health, language skills, academic skills, social skills, and emotional characteristics (including temperament, self-confidence, and self-direction)?

The answers to these questions may be briefly summarized as follows:

1. The type of kindergarten program children attend (half-day, alternate full-day, or full-day) appears to produce little difference between children either while they are in Kindergarten or two years later. (See chapter 5.)

2. Children perceived as "thriving", "average", or "non-thriv-ing" in terms of their teachers' goals differed markedly on language and academic skills in all four grade levels studied, although dif-ferences were smaller in Grade 1 than in Grade 2. Kindergarten and Grade 2 children also differed markedly by thrive status in social skills, seven temperamental characteristics,[1] and self-confidence and self-direction. Grade 1 children typically showed the same pattern of differences, but they were not large enough to be statistically sig-nificant. (See chapter 4.) In general, it appears that teachers' perceptions of thrive status in Senior Kindergarten were more effective indicators of functioning two years later than were teachers' per-ceptions of thrive status in Junior Kindergarten. This may mean that children are more susceptible to environmental change at age four, or that characteristics that influence later functioning have simply not yet matured, or both.

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1. Approach/withdrawal, positive mood, adaptability, persistence, distractibility, activity level, and negative mood.

There was some evidence that non-thrivers might be somewhat less cognitively mature than thriving or average children. They obtain lower scores on a test of working memory (indicative of the development of concrete operations) and on a test of letter reading speed.

There were no overall thrive-related differences in age or health (indexed by days absent for illness). However, age did have some relationship to thrive status.

While kindergarten thrive status, which was used to select the sample studied, was clearly related to children's functioning in Grade 1 and even more in Grade 2, this does not mean all children remained the same. A large number of non-thrivers in Kindergarten were perceived as average by Grade 1 and 2 teachers and similarly, a number of average kindergartners were perceived as thriving in Grades 1 and 2. Examination of both test scores and social, temperamental, and self-process ratings indicated that these perceived changes in thrive status were related to differences in functioning. (See chapter 6.)

Kindergarten measures were examined to see which predicted changes in thrive status. Age was one factor. Consistent non-thrivers (in Grade 2) were younger than those who changed to average status. None of the language or academic or social skills tests consistently predicted changes in thrive status. However, Senior Kindergarten temperament ratings of adaptability, persistence, distractibility, activity level, and positive mood all discriminated between consistent non-thrivers and those who changed to average status in Grade 2. Temperament did not predict changes between average and thriving status. Tester ratings of self-direction in the Senior Kindergarten testing sessions did predict shifts from non-thriving to average status. The only predictor of shifts from average to thriving status and vice versa was father's occupation. Again, this finding was limited to the Senior Kindergarten/Grade 2 cohort.

3. Analysis of correlations between measures indicated that most academic skills, adult-led group skills, a cluster of temperamental ratings consisting of persistence, distractibility, and activity level, and self-confidence and self-direction, were moderately to substantially correlated with each other, both concurrently and between 1978 and 1980.

Social skills were related concurrently with a second cluster of temperamental characteristics - approach/withdrawal, positive mood, and adaptability - as well as with self-confidence. Grade 2 social peer and adult-led group skills were correlated with the kindergarten persistence-distractibility-activity cluster, and with self-confidence.

Temperamental characteristics formed two major clusters, both concurrently and between 1978 and 1980. These were the persistence-distractibility-activity level variables and the approach/withdrawal-adaptability-positive mood variables.

Self-confidence and self-direction were strongly related to both clusters of temperament variables when examined concurrently. Over time, Grade 1 and 2 self-confidence was only moderately related to kindergarten self-confidence and distractibility. Grade 1 and 2 self-direction was more strongly related to kindergarten variables, including the persistence-distractibility-activity cluster as well as adaptability and self-confidence.

It is important to note that while a number of kindergarten social and emotional variables were associated with Grade 1 and 2 skill tests, the reverse was not true. (See chapters 7 and 8.)

Multiple correlation analysis of relationships between selected skill, social, temperamental, and self-variables generally indicated that any given variable could be predicted with considerably greater accuracy by combining two or three variables than by any one variable. In concurrent correlations, the best combination of predictors were frequently from the same domain (e.g., skills or social and emotional variables). Over time, the best predictors of academic skills generally included social and emotional variables first, with kindergarten academic skills adding additional variance. Thrive ratings generally increased prediction of academic skills beyond that obtained by other variables, but did not do so for social and emotional variables.

Examination of the relationship between demographic variables and children's characteristics suggests that, for the sample studied, the usual effects of parents' education and occupation on children's academic performance were not present. Similarly, parents' education and occupation were not significantly related to social and emotional variables. (See chapter 7.) It is important to note that this is an unusual sample in that most children were attending rural Catholic schools. There was only one fatherless family among 213 children, and only one family with an unemployed father. (See chapter 3.) Within this unusual population, traditional social class variables had little relationship to thrive status or specific measures of children's functioning.

Implications

What Is a "Thriving" Child? It appears that a large number of intellectual, academic, social, temperamental, and self-process characteristics are linked together - at least in the environments we currently provide children in schools. The consistent set of relationships found between these variables at all four grade levels studied suggests that this is not simply an artifact of the original selection process. (Note that many of the patterns observed in other grades held for Grade 1 where the relationship between original thrive categories and these variables was much reduced.) In a sense, this implies that some children are better "adapted" to school environments than others by reason both of their skills and their patterns of response to their environment (temperament).

Changes in Thrive Status. At the same time it must be stressed that the effectiveness of adaptation reflected in thrive ratings is not necessarily a fixed or permanent state. Many children changed over the two-year period, happily most for the better (as perceived by teachers).

Of course some of the observed change must reflect nothing more than the inaccuracy of both tests and rating procedures; all psychological measures, both formal and informal, must be recognized as at best viewing "through a glass darkly". (See Fair, 1980, pp. 66-76.) None the less, a number of patterns reported in this study were sufficiently strong to be repeated in two groups of children over a two-year interval.

Classroom Implications. Education in the Primary and Junior Divisions (Ontario Ministry of Education, 1975), a major document outlining recommended educational practices in Ontario schools, sets out four major objectives:

1. acquisition of basic skills and knowledge (including problem solving, a type of self-direction)

2. development and maintenance of confidence and a sense of self-worth (including perseverance and curiosity or the approach/withdrawal dimension)

3. knowledge and attitudes for active participation in Canadian society

4. development of moral and aesthetic sensitivity necessary for a complete and responsible life (including self-respect and respect for others

The present study has emphasized the interdependence of the first and second objectives. The fourth objective involves, among other things, social skills and empathy.

Although Education in the Primary and Junior Divisions clearly identifies all of these goals, and at many points recognizes the relationship between the first and second, it does not provide much content on means of implementing any objectives other than the "acquisition of basic skills and knowledge" and to some extent the arts. A similar lack of content for implementing non-academic objectives exists in Observing Children, recently published by the Toronto Board of Education.

Given the findings of this study, it is clear that greater weight should be given to objectives involving self-confidence and worth, self-direction, and social skills, both as worthwhile ends in themselves and as necessary prerequisites for "basic skills and knowledge".

In practice, this means that teachers need to be not only sensitive to individual differences in children's skill progress, so that they can teach in a manner that ensures genuine progress (and thus confidence) for each child, but also sensitive to differences in children's patterns of response to their environment (temperament), to their social strategies, and to their self-directive capacities and strategies. These are not impossible dreams. Much has been accomplished in recent years in describing both techniques for teaching social skills and techniques for facilitating self-control and direction. (See Kent and Rolf, 1979, for a number of reviews of work on children's social skills and characteristics of vulnerability, and Mischel and Patterson, 1978, and Meichenbaum, 1977, for methods of self-control and direction.) The positive changes observed in many of the children in this study doubtless indicate what good teaching can do.

The task now is to identify more clearly and implement effective classroom strategies for facilitating the development of all children, not just those fortunate enough to have been designed by family and nature to "thrive" in school.

Summary

The Problem

This study was a continuation of a study of kindergarten programs conducted by the author in 1978 (Biemiller, 1978). The research reported in this study concerns three major questions:

1. Does attending half-day, alternate full-day, or full-day Kindergarten make any difference to children's functioning in a variety of areas (health, language, academic performance, social skills, or emotional functioning) either in Kindergarten (Junior or Senior) or in Grades 1 or 2?

2. What differences characterize children perceived by their kindergarten teachers to be "thriving", "average", or "non thriving" in terms of the teachers' goals both in Kindergarten (Junior or Senior) and in Grades 1 or 2?

3. Among children from Junior Kindergarten to Grade 2, what relationships exist concurrently and longitudinally between demographic characteristics, health, language skills, academic skills, social skills, and emotional characteristics (including temperament, self-confidence, and self-direction)?

Sample and Research Methods

This study involved 213 Roman Catholic separate school children who either attended Junior Kindergarten in 1978 and Grade 1 in 1980 (69 children) or Senior Kindergarten in 1978 and Grade 2 in 1980 (144 children). Of these, 76 children had been identified by their kindergarten teachers as "thriving in terms of my goals", 80 as "making average progress", and 57 as "not yet thriving". Sixty of the children attended regular half-day Junior or Senior Kindergarten, 82 attended alternate full-day Junior or Senior Kindergarten, and 70 attended full-day Senior Kindergarten.

Measures

Data were obtained for all children concerning their thrive ratings, health, language and academic skills, social skills, temperamental characteristics, self-confidence, and self-direction. In addition, demographic information was obtained in 1980. The following specific measures were used:

Thrive Ratings, 1978

Teachers were asked to select two children who were "thriving in terms of your goals", two who were "making average progress in terms of your goals" and two who were "not as yet thriving in terms of your goals". Not all teachers felt able to select two children in each category, so the numbers of thriving, average, and non-thriving children vary.

Thrive Ratings, 1980

After all testing and ratings were completed, teachers were asked to think of their class as being divided into three equal groups, using the same definition of "thriving", "average", and "non-thriving" given above. They were then asked into which group each child in their class from the longitudinal study would fall.

Health, 1978 and 1980

Indexed by days absent for illness as reported by school and checked with parents.

Language, 1978

CIRCUS Say and Tell Test (includes some vocabulary, grammatical usage, and fluency in story-telling)

Language, 1980

Bankson Language Test (vocabulary, grammatical usage)

Verbal fluency subtest from CIRCUS Say and Tell

Academic Skills, 1978

CIRCUS How Much and How Many Test (quantitative concepts and knowledge of numbers)

CIRCUS Recognizing Letters and Numbers Test (pointing to correct printed letter or number when letter or number was named)

Academic Skills, 1980

Metropolitan Achievement Test Mathematics Computation Scale (solving specific computational problems)

Metropolitan Achievement Test Word Knowledge Scale (associating specific printed words with pictures or other words)

Grey Oral Reading Test (reading grades passages aloud; scored for accuracy and speed).

Biemiller Test of Reading Processes (reading letters, words out of context, and with same words in context aloud; scored for speed)

Social Skills, 1978 and 1980

Social Abilities Rating Scale (teacher rating scale developed by the author based in part on work of Wright, 1980 and White and Watts, 1973; includes subscales for skills with peers, skills with adults, skills in adult-led groups, and empathy)

Temperament, 1978 and 1980

Teacher-rated Temperament Scale (developed by Thomas, Chess, and Korn, 1977, and shortened by the author)

Temperament involves patterns of response to the environment. Nine subscales were used persistence, distractibility, activity level, willingness to approach new situation, adaptability to change, positive mood, negative mood, threshold of stimuli evoking responses, and intensity of responses.

Self-confidence, 1978 and 1980

Teacher ratings of responses to failure, willingness to learn new skills, and general self-confidence were obtained in 1978 and 1980. These were combined into a single scale. This form was developed by the author.

Tester-rated Self-direction, 1978 and 1980

Research staff who administered tests to children in 1978 and 1980 filled out CIRCUS Behavior Inventories on the children's behaviour in the test setting. Three items from this 13-item scale dealt with self-direction or control: "answers questions randomly", "keeps place", and "considers answers carefully".

Self-direction, 1980

Teachers of Grade 1 and Grade 2 children rated self-direction in school. There were four subscales: free time in class, following classroom management routines (e.g., behaviour, use of equipment), following academic routines (e.g., using learning aids when needed, choosing appropriate work), and carrying out teacher-set tasks (e.g., seatwork, completing assignments, etc.). This scale was developed by the author.

Demographic Information

Parents were interviewed by telephone. They supplied information on children's absences, languages spoken in the home, after-school care, and mother's and father's education and occupation.

Procedures

All children were tested and rated in May or June 1978 and May 1980. Testers were not informed of children's thrive categories until after testing and tester rating in 1978. Neither testers nor teachers were informed of 1978 thrive ratings in 1980, nor did testers obtain 1980 thrive ratings until after testing and tester rating was completed.

Results

The answers to the questions set out at the beginning of this summary are as follows:

1. The type of kindergarten program children attend (half-day, alternate full-day, or full-day) appears to produce little difference between children either while they are in Kindergarten or two years later. (See chapter 5.)

2. Children perceived as "thriving", "average", or "non thriving" in terms of their teachers' goals differ markedly on language and academic skills in all four grade levels studied, although differences were smaller in Grade 1 than in Grade 2. Kindergarten and Grade 2 children also differed markedly by thrive status in social skills, seven temperamental characteristics,[1] and self-confidence and self-direction. Grade 1 children typically showed the same pattern of differences, but they were not large enough to be statistically significant. (See chapter 4.) In general, it appears that teachers' perceptions of thrive status in Senior Kindergarten were more effective indicators of functioning two years later than were teachers' perceptions of thrive status in Junior Kindergarten. This may mean that children are more susceptible to environmental change at age four, or that characteristics that influence later functioning have simply not yet matured, or both.

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Kindergarten measures were examined to see which <u>predicted</u> changes in thrive status. Age was one factor. Consistent non-thrivers (in Grade 2) were younger than those who changed to average status. None of the language or academic or social skills tests consistently predicted changes in thrive status. However, Senior Kindergarten temperament ratings of adaptability, persistence, distractibility, activity level, and positive mood all discriminated between consistent non-thrivers and those who changed to average status in Grade 2. Temperament did not predict changes between average and thriving status. Tester ratings of self-direction in the Senior Kindergarten testing sessions did predict shifts from non-thriving to average status. The only predictor of shifts from average to thriving status and vice versa was father's occupation. Again, this finding was limited to the Senior Kindergarten-Grade 2 cohort.

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3. Analysis of correlations between measures indicated that most academic skills, adult-led group skills, a cluster of temperamental ratings consisting of persistence, distractibility, and activity level, and self-confidence and self-direction, were moderately to substantially correlated with each other, both concurrently and between 1978 and 1980.

Social skills were related concurrently with a second cluster of temperamental characteristics - approach/withdrawal, positive mood, and adaptability - as well as with self-confidence. Grade 2 social peer and adult-led grouup skills were correlated with the kindergarten persistence-distractibility-activity cluster, and with self-confidence.

Temperamental characteristics formed two major clusters, both concurrently and between 1978 and 1980. These were the persistence-distractibility-activity level variables, and the approach/withdrawal-adaptability-positive mood variables.

Self-confidence and self-direction were strongly related to both clusters of temperament variables when examined concurrently. Over time, Grade 1 and 2 self-confidence was only moderately related to kindergarten self-confidence and distractibility. Grade 1 and 2 self-direction was more strongly related to kindergarten variables, including the persistence-distractibility-activity cluster as well as adaptability and self-confidence.

It is important to note that while a number of kindergarten social and emotional variables were associated with Grade 1 and 2 skill tests, the reverse was not true. (See chapters 7 and 8.)

Multiple correlation analysis of relationships between selected skill, social, temperamental, and self-variables generally indicated that any given variable could be predicted with considerably greater accuracy by combining two or three variables than by any one variable. In concurrent correlations, the best combination of predictors were frequently from the same domain (e.g., skills or social and emotional variables). Over time, the best predictors of academic skills generally included social and emotional variables first, with kindergarten academic skills adding additional variance. Thrive ratings generally increased prediction of academic skills beyond that obtained by other variables, but did not do so for social and emotional variables.

Examination of the relationship between demographic variables and children's characteristics suggests that, for the sample studied, the usual effects of parents' education and occupation on children's academic performance were not present. Similarly, parents' education and occupation were not significantly related to social and emotional variables. (See chapter 7.) It is important to note that this is an unusual sample in the most children were attending rural Catholic schools. There was only one father-less family among 213 children, and only one family with an unemployed father. (See chapter 3.) Within this unusual population, traditional social class variables had little relationship to thrive status or specific measures of children's functioning.

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The present study has emphasized the interdependence of the first and second objectives. The fourth objective involves, among other things, social skills and empathy.

Although Education in the Primary and Junior Divisions clearly identifies all of these goals, and at many points recognizes the relationship between the first and second, it does not provide much content on means of implementing any objectives other than the "acquisition of basic skills and knowledge" and to some extent objectives in "the arts". A similar lack of means for achieving social/emotional objectives exists in Observing Children, recently published by the Toronto Board of Education.

Given the findings of this study, it is clear that greater weight should be given to objectives involving self-confidence and worth, self-direction, and social skills, both as worthwhile ends in themselves and as necessary prerequisites for the "acquisition of basic skills and knowledge".

In practice, this means that teachers need to be not only sensitive to individual differences in children's skill progress, so that they can teach in a manner that ensures genuine progress (and thus confidence) for each child, but also sensitive to differences in children's patterns of response to their environment (temperament), to their social strategies, and to their self-directive capacities and strategies. These are not impossible dreams. Much has been accomplished in recent years in describing both techniques for teaching social skills and techniques for facilitating self-control and direction. (See Kent and Rolf, 1979, for a number of reviews of work on children's social skills and characteristics of vulnerability, and Mischel and Patterson, 1978, and Meichenbaum, 1977, for methods of self-control and direction.) The positive changes observed in many of the children in this study doubtless indicate what good teaching can do.

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Appendix A. Measures Developed for This Study

Appendix A-1

Teacher-rated Social Ability Scale

Adapted from Mary Wright
University of Western Ontario
and Burton white, Harvard University

Kindergarten Project
Institute of Child Study
University of Toronto
April 1980

Social Ability

Child's name_____

1. Successfully leads other children in co-operative, constructive, or dramatic play in a pleasant way (indluences peers' behaviour by suggesting activities, things to make, and roles; or by giving advice on how to carry out activities, etc.).	1 never or less than once a month	2 once a month to three times a month	3 at least once a week	4 at least once a day	5 several times a day	(N.A) not applicable
2. Child takes turns and follows rules in physical activity and games (e.g., hop-scotch, baseball, games at recess, relays, organized gym games).	1 never or less than once a month	2 once a month to three times a month	3 at least once a week	4 at least once a day	5 several times a day	(N.A) not applicable
3. Child takes turns in classroom games (e.g., Bingo, math games, Concentration, Memory, spelling games, checkers).	1 never or less than once a	2 once a month to three times a month	3 at least once a week	4 at least once a day	5 several times a day	(N.A.) not applicable

4. Successfully gets the attention of other children in a pleasant, acceptable way (by moving towards, standing or sitting near, touching, calling to, showing something, telling something).	1 never or less than once a month	2 once a month to three times a month	3 at least once a week	4 at least once a day	5 several times a day	(N.A.) not applicable
5. Successfully uses other children as a resource (seeks information, explanations, or judgements; seeks help with equipment, etc.).	1 never or less than once a month	2 once a month to three times a month	3 at least once a week	4 at least once a day	5 several times a day	(N.A.) not applicable
6. Successfully gets the attention of an adult in a pleasant, acceptable way (by moving towards, standing or sitting near, touching, calling to, showing something, telling something).	1 never or less than once a month	2 once a month to three times a month	3 at least once a week	4 at least once a day	5 several times a day	(N.A.) not applicable
7. Successfully uses an adult as a resource (seeks information, explanations, or judgements; in peer disputes seeks help with equipment, clothes, etc.)	1 never or less than once a month	2 once a month to three times a month	3 at least once a week	4 at least once a day	5 several times a day	(N.A.) not applicable
8. The child expresses affection to other children and this affection is accepted positively by them.	1 never or less than once a month	2 once a month to three times a month	3 at least once a week	4 at least once a day	5 several times a day	(N.A.) not applicable

9. The child expresses affection to adults and this affection is accepted positively by them.	1 never or less than once a month	2 once a month to three times a month	3 at least once a week	4 at least once a day	5 several times a day	(N.A.) not applicable
10. During teacher-guided group activity the child						
a. participates in activities as part of the group.	1 never or almost never	2 infre-quently	3 occas-ionally	4 fairly often	5 very often	(N.A.) not applicable
b. answers questions when called on.	1 never or almost never	2 infre-quently	3 occas-ionally	4 fairly often	5 very often	(N.A.) not applicable
c. listens to other children.	1 never or almost never	2 infre-quently	3 occas-ionally	4 fairly often	5 very often	(N.A.) not applicable
d. will address the whole group (e.g., show and tell, etc.).	1 never or almost never	2 infre-quently	3 occas-ionally	4 fairly often	5 very often	(N.A.) not applicable
11. The child is aware of he impact of his/her behaviour on others.	1 never or almost never	2 infre-quently	3 occas-ionally	4 fairly often	5 very often	(N.A.) not applicable
12. The child is concerned about the needs and feelings of others.	1 never or almost never	2 infre-quently	3 occas-ionally	4 fairly often	5 very often	(N.A.) not applicable

Comments re child or measure.

Appendix A-2

Teacher-rated Temperament Scales

A. Biemiller and K. Main
Institute of Child Study
University of Toronto
1981

Thomas, Chess, and Korn's Teacher-rated
Temperament Scales

These rating scales are made up of statements about children's behaviour in specific circumstances. The rates indicate that the behaviour of the child being rated is typically "very like" to " very unlike" the described behaviour.

There are four items for each of seven temperamental dimensions identified by Thomas and Chess (1977), including approach/withdrawal, persistence, adaptability, activity level, distractibility, threshold of response, and intensity of reactions. An eighth dimension--mood--has been split by us into positive mood and negative mood on the basis of data indicating that variations in positive mood ratings were unrelated to variations in negative mood ratings. The four items for each temperamental dimension were selected from larger eight-item lists developed by Thomas, chess, and Korn (1977) on the basis of correlations between items as rated by teachers in a study involving 340 kindergarten children and 59 teachers (Biemiller, 1978).

These ratings scales include some positive items on which indicating that a child is "very like" the child described in the item indicates that she/he strongly demonstrates the temperamental trait the item represents. The child's rating (1 to 7) on these positive items is entered into his/her scale score directly.

There are also negative items on which rating a child as "very unlike" the child described in the item indicates that he/she strongly demonstrates the temperamental trait the item represents. For these items, the child's actual rating must be subtracted from 8 to obtain a score comparable to a positive item score. For example, consider a very active child. such a child would receive a low rating on activity scale item 5, "Child is able to sit quietly for a reasonable amount of time (as compared to classmates)." A very active child might receive a rating of 2 on this item. Subtracting 2 from 8 gives a score of 6, indicating that the child is very active. This procedure was used for negative items in determining a child's scale score.

Mean scale scores for each child consisted of the total scale score divided by 4 (the number of items in each scale) so that means could be related to the response scale of 1 to 7.

Items are shown here grouped by scale. Item numbers show the order in which the items appeared on the teacher's rating form. The order of items was intended to avoid having teachers form "sets" and respond to all items similarly.

1	2	3	4	5	6	7
hardly ever	infrequently	once in a while	sometimes	often	very often	almost always

Approach/Withdrawal Scale

(negative item)	1. Child is shy with adults he/she doesn't know.	hardly ever	1	2	3	4	5	6	7	almost always
(negative item)	15. Child will initially avoid new games and activities, preferring to sit on the side and watch.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	20. Child gets involved immediately in new learning situations.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	33. Child will get up and perform before the class (sing, recite, etc.) with no hesitation, even the first time.	hardly ever	1	2	3	4	5	6	7	almost always

Adaptability Scale

(negative item)	4. After an absence of many days or a long holiday, it takes a long time for this child to readjust to school routine.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	10. If initially hesitant about entering into new games and activities, child gets over it quickly.	hardly ever	1	2	3	4	5	6	7	almost always
(negative item)	27. Child adjusts to changes in school routine, rules, or procedures only after a long time.	hardly ever	1	2	3	4	5	6	7	almost always
(negative item)	32. Child takes a long time to become comfortable in a new physical location (e.g., different classroom, new seat, etc.).	hardly ever	1	2	3	4	5	6	7	almost always

1	2	3	4	5	6	7
hardly ever	infrequently	once in a while	sometimes	often	very often	almost always

Persistence Scale

(positive item)	2.	If child's activity is interrupted he/she tries to go back to the activity.	hardly ever	1	2	3	4	5	6	7	almost always
(negative item)	12.	Child quickly becomes impatient with a task he/she cannot grasp and goes on to something else.	hardly ever	1	2	3	4	5	6	7	almost always
(negative item)	21.	During free play, child will stick to any one activity for only a short time.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	34.	Child can continue at same activity for over an hour.	hardly ever	1	2	3	4	5	6	7	almost always

Distractibility Scale

(negative item)	7.	Child cannot be distracted when he/she is working (seems to be able to concentrate in the midst of bedlam).	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	11.	Child is easily drawn away from his/her work by noises, something outside the window, another child's whispering, etc.	hardly ever	1	2	3	4	5	6	7	almost always
(negative item)	24.	If other children are talking or making noise while teacher is explaining a lesson, this child remains attentive to the teacher.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	31.	This child is easily sidetracked.	hardly ever	1	2	3	4	5	6	7	almost always

1 hardly ever	2 infrequently	3 once in a while	4 sometimes	5 often	6 very often	7 almost always

Activity Scale

(negative item)	5.	Child is able to sit quietly for a reasonable amount of time (as compared to classmates).	hardly ever	1	2	3	4	5	6	7	almost always
(negative item)	16.	Child sits still when a story is being told or read.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	23.	If recess must be skipped so child doesn't have usual outlet, he/she becomes restless.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	29.	Child seems to have difficulty sitting still, may wriggle a lot or get out of seat.	hardly ever	1	2	3	4	5	6	7	almost always

Intensity of Reaction Scale

(positive item)	9.	When telling a story, such as what happened on the weekend or during a vacation, the child talks about it loudly, with enthusiasm and excitement.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	14.	Child's responses are loud.	hardly ever	1	2	3	4	5	6	7	almost always
(negative item)	19.	It is hard to tell what this child is feeling (either positive or negative) as there is very little change in facial expressions.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	30.	Child lets other children know when he/she does not like something by yelling or fighting.	hardly ever	1	2	3	4	5	6	7	almost always

1 hardly ever	2 infrequently	3 once in a while	4 sometimes	5 often	6 very often	7 almost always

Positive Mood Scale

(positive item)	3.	When with other children this child seems to be having a good time.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	13.	Child enjoys going on errands for the teacher.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	17.	Child smiles, laughs.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	25.	Child enjoys listening to stories.	hardly ever	1	2	3	4	5	6	7	almost always

Negative Mood Scale

(positive item)	6.	When playing with other children this child argues with them.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	22.	Child becomes easily upset when he/she loses a game.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	28.	Child complains to teacher about other children.	hardly ever	1	2	3	4	5	6	7	almost always
(positive item)	35.	When child can't have or do something he/she wants, child becomes annoyed or upset.	hardly ever	1	2	3	4	5	6	7	almost always

1	2	3	4	5	6	7
hardly ever	infrequently	once in a while	sometimes	often	very often	almost always

Threshold of Response Scale

Thresh +	8. Child is very conscious of odours, comments on pleasant or unpleasant smells.	hardly ever	1	2	3	4	5	6	7	almost always
Thresh ±	18. Child remarks if teacher or classmates wear new clothes.	hardly ever	1	2	3	4	5	6	7	almost always
Thresh +	26. Child is sensitive to temperature and likely to comment on classroom being too hot or cold.	hardly ever	1	2	3	4	5	6	7	almost always
Thresh +	36. Child is highly sensitive to changes in the brightness or dimness of light.	hardly ever	1	2	3	4	5	6	7	almost always

Appendix A-3

Teacher-rated Self-confidence Scale

Self-confidence Scale

1. When confronted with a new situation involving new skills, does the child make a good effort to try? Circle one:

1	2	3	4	5
never or almost never	rarely	sometimes	fairly often	nearly always or always

2. When the child fails at a given task, what is his/her usual reaction: Circle one:

1	2	3	4	5
very negative: may throw a tantrum; unlikely try again	negative: self-confidence lower the next time he/she approaches	no reaction: doesn't seem to care; may or may not try again	positive: not upset but somewhat more determined to succeed next time	very positive: very determined and confident next time

3. Make a general assessment of the child's approach to most situations. Circle one:

1	2	3	4	5
not confident at all	not confident very often	varies	often confident	always very confident

4. Additional comments (re child or measure)

Appendix A-4

Teacher-rated Self-direction Scale

Teacher Ratings

SELF-DIRECTION

Directions: Rate how frequently the child exhibits self-directed behaviour within the situation in each item.

Think in terms of a 5-point scale as follows:

rarely	sometimes	about half	frequently	almost always	applicable
1	2	3	4	5	(N.A.)
rarely	sometimes	about half the time	often/ frequently	usually/ almost always	not applicable

Example: For item 6, "Child follows procedures for special events (e.g., library, field trips, fire drill) rate child 4 if he/she is "often" or "frequently" self-directed (i.e., "Follows procedures") in this type of situation.

Teacher Ratings

FREE TIME IN CLASS

1. Child chooses an activity independently.	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable
2. Child is able to initiate productive activity (e.g., project).	1 Rarely	2 Some times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable
3. After choosing an activity or project, child can plan and carry it through to completion with a minimum of adult supervision.	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable

CLASSROOM MANAGEMENT ROUTINES

4. Child takes responsibility for care and storage of materials and equipment.	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable
5. Child follows behaviour guidelines without being reminded.	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable
6. Child follows procedures for special events (e.g., library, field trips, fire drill).	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually almost always	(N.A.) Not Applicable

ACADEMIC ROUTINES

7. On own initiative child makes use of dictionary, charts, other learning aids.	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable
8. When given a choice in academic work periods, child can choose appropriate work with minimum of adult direction (e.g., book to read, math work, writing).	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable
9. Child brings materials from home when asked (e.g., for show and tell, junk material for projects, art).	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable

TEACHER-SET TASKS

10. Child carries out teacher-set task (e.g., runs errand, delivers message, helps another child).	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable
11. Child follows instructions for seat work with a minimum of adult assistance.	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable
12. Given an assignment at his or her level of ability, child can complete it in a reasonable amount of time.	1 Rarely	2 Some-times	3 About half the time	4 Often/ frequ-ently	5 Usually/ almost always	(N.A.) Not Applicable

Appendix B. Supplementary Tables for Chapter Five

Table B-1

Say and Tell Pennies by Grade and Program[a]
(Standard Deviations in Parentheses)

	Junior Kindergarten			Senior Kindergarten				
	HD	AFD	sig.	HD	AFD	RFD	UFD	sig.
N	27	42		34	40	45	25	
$\bar{x}$ (sd)	3.0(1.3)	2.7(1.2)	ns	3.8(1.5)	3.8(1.2)	3.9(1.3)	3.4(1.8)	ns

a. Means are based on the average of thriving, average, and non-thriving children means in order to adjust for numbers of children in each group in each program.

Table B-2

Bankson Vocabulary Scales by Program[a, b]

(Standard Deviations in Parentheses)

	Grade 1			Grade 2				
	HD	AFD	sig.	HD	AFD	RFD	UFD	sig.
N	27	42		34	40	45	25	
Nouns	8.6(0.7)	8.6(0.6)	ns	8.7(0.5)	8.7(0.5)	8.7(0.7)	8.8(0.4)	ns
Cate-gories	7.1(0.7)	6.9(0.7)	ns	7.5(0.6)	7.1(0.5)	7.3(0.8)	7.1(0.7)	.02
Prep.	7.4(1.3)	7.6(1.4)	ns	7.9(1.2)	8.3(0.7)	8.0(0.8)	7.6(1.3)	.03
Opps.	6.7(1.0)	6.3(0.7)	ns	7.7(0.9)	7.3(1.6)	7.3(1.2)	7.0(1.0)	ns
Com-bined	7.0(0.6)	7.4(0.7)	ns	7.9(0.5)	7.8(0.5)	7.8(0.5)	7.7(0.6)	ns

a. See note a on Table B-1.

b. Maximum score on each subscale = 9.

Table B-3

Bankson Functional Language (Grammar) Scores

by Grade and Program[a, b]

(standard deviations in parentheses)

	Grade 1			Grade 2				
	HD	AFD	sig.	HD	AFD	RFD	UFD	sig.
N	27	42		34	40	45	25	
Verb Tenses	7.9(1.6)	7.8(1.6)	ns	8.1(1.2)	7.5(1.4)	7.8(1.2)	7.6(1.3)	ns
Plurals	6.6(1.6)	6.5(1.2)	ns	8.1(1.2)	7.5(1.4)	7.8(1.2)	7.6(1.3)	ns
Subj-Verb Agree.	8.5(.7)	8.6(.7)	ns	8.6(.6)	8.9(.4)	8.8(.6)	8.4(.9)	.05
Sentence Compl.	7.8(1.4)	7.8(1.3)	ns	8.3(.9)	8.3(1.0)	8.3(.9)	8.4(.8)	ns

a. See note a on Table B-1.

b. Maximum score on each subscale = 9.

Table B-4

Mean Numbers of Words Used in

Narrating Stories by Grade and Program[a]

	HD	AFD	RFD	UFD	sig.
Junior K					
N	27	42			
$\bar{x}$ (sd)	57.2(35.4)	58.9(39.6)			ns
Senior K					
N	34	40	45	25	
$\bar{x}$ (sd)	63.2(46.5)	92.3(59.8)	71.1(38.5)	63.2(27.5)	.01
Grade 1					
N	27	41			
$\bar{x}$ (sd)	79.3(45.1)	82.7(00.2)			ns
Grade 2					
N	33	40	44	25	
$\bar{x}$ (sd)	104.9(62.9)	107.1(70.5)	124.4(73.8)	94.7(70.1)	ns

a. See note a on Table B-1.

Table B-5

Kindergarten Mathematical Skills

by Grade and Program[a]

	Junior Kindergarten			Senior Kindergarten				
	HD	AFD	sig.	HD	AFD	RFD	UFD	sig.
N	27	42		34	40	45	25	
Number Recog.								
$\bar{x}$(sd)	2.9(0.9)	3.1(1.2)	ns	3.8(0.8)	3.8(0.9)	4.0(0.8)	4.0(1.0)	ns
How much/ How many								
$\bar{x}$(sd)	28.5(6.5)	27.6(5.4)	ns	35.4(3.4)	34.4(4.6)	35.4(4.4)	34.9(4.7)	ns

a. See note a on Table B-1

Table B-6

Grade 1 and 2 Mathematics

Computation (MAT) Scores[a]

(standard deviations in parentheses)

	Grade 1			Grade 2				
	HD	AFD	sig.	HD	AFD	RFD	UFD	sig.
N	27	42		34	39	43	25	
% Correct[b]	54%(20%)	68%(41%)	.10	60%(28%)	62%(20%)	60%(19%)	60%(18%)	ns
Standard Score	c	c		54.0(11.5)	55.9(11.9)	55.5(9.8)	55.4(9.0)	ns
Grade Equiv.	c	c		2.8	3.0	3.0	2.9	

a. See note a on Table C-1

b. Grade 1, 27 items; Grade 2, 33 items.

c. Incomplete scale used, no standard scores or grade equivalents available.

Table B-7

Letter Recognition Scores by Grade and Program[a]

	Junior Kindergarten			Senior Kindergarten				
	HD	AFD	sig.	HD	AFD	RFD	UFD	sig.
N	27	42		34	40	45	25	
$\bar{x}$ (sd)	11.1(3.8)	10.7(3.8)	ns	14.3(1.3)	13.1(3.1)	13.9(2.1)	14.0(1.9)	ns

a. See note a on Table C-1.

Table B-8

Scores on the (MIT) Word Knowledge, and the Grey Oral Reading Tests by Grade and Program

	Grade 1			Grade 2				
	HD	AFD	sig.	HD	AFD	RFD	UFD	sig.
N	27	42		34	40	45	25	
Word Knowl. stand. score $\bar{x}$(sd)	42.1(9.2)	44.8(9.7)	ns	57.2(11.2)	57.9(11.0)	59.1(11.4)	56.9(12.3)	ns
Grey Oral Reading score $\bar{x}$(sd)	9.9(6.3)	13.6(8.9)	ns	21.0(11.8)	23.8(9.6)	23.4(11.1)	20.7(10.2)	
grade equiv.[a]	1.6	1.8		2.3	2.6	2.5	2.1	ns

a. Boys' norms used. (Girls' norms yield slightly lower grade equivalents).

Table B-9

Seconds per Letter, Word, and Text Words
by Grade and Program[a]

	Grade 1			Grade 2				
	HD	AFD	sig	HD	AFD	RFD	UFD	sig.
Letters								
N	26	42		34	40	45	25	
$\bar{x}$(sd)	1.01(2.9)	.99(.37)	ns	.71(.15)	.75(.20)	.76(.21)	.80(.17)	.05
Words								
N	b	b		30	37	41	23	
$\bar{x}$(sd)				.87(.24)	.88(.24)	.93(.45)	.92(.23)	ns
Words in Text								
N	b	b		33	39	44	23	
$\bar{x}$(sd)				.60(.21)	.57(.19)	.61(.31)	.63(.23)	ns

a. See note a on Table B-1.

b. Too few children were able to read material.

TABLE B-10

Temperament Scales for Grades 1 & 2 by Program
(standard deviations in parentheses)

	Grade One			Grade Two				
	HD	AFD	Sig	HD	AFD	REP	UFD	Sig
Approach/ Withdrawal	4.4(1.8)	4.6(1.2)	ns	4.7(1.3)	5.4(1.2)	5.0(1.4)	4.7(1.4)	ns
Positive Mood	5.5(1.2)	5.6(.9)	ns	5.8(1.0)	6.0(1.0)	6.1(.9)	5.7(1.1)	ns
Adaptability	5.2(1.3)	5.3(1.1)	ns	5.4(1.2)	5.6(1.4)	5.6(.9)	5.5(1.0)	ns
Persistance	4.5(1.4)	5.1(1.1)	.07	4.7(1.5)	4.8(1.6)	4.7(1.3)	4.8(1.4)	ns
Distractability	3.8(1.1)	4.3(1.0)	.05	3.8(1.3)	3.8(1.3)	4.2(1.3)	4.1(1.1)	ns
Activity	2.7(1.4)	2.8(1.4)	ns	2.8(1.6)	2.6(1.8)	3.0(1.7)	2.6(1.6)	ns
Negative Mood	2.5(1.2)	2.9(1.3)	ns	3.1(1.4)	2.5(1.6)	2.5(1.3)	2.6(1.5)	ns
Intensity	4.0(1.1)	3.7(1.1)	ns	4.2(1.2)	4.0(1.4)	4.2(1.3)	3.8(1.3)	ns
Threshold	3.1(.9)	3.3(1.3)	ns	3.2(1.6)	2.8(1.2)	3.1(1.1)	2.2(.8)	ns

See note [a] on Table B-1

TABLE B-11

Self Confidence Ratings for Grades 1 & 2 by Program
(standard deviations in parentheses)

	HD	AFD	REP	UFD	Sig
Grade 1					
Response to New Task	4.0(0.8)	4.1(0.7)			ns
Response to Failure	3.5(0.8)	3.7(1.1)			ns
General Self Confidence	3.7(0.9)	3.7(0.9)			ns
Combined Self Confidence	3.7(0.7)	3.8(0.8)			ns
Grade 2					
Response to New Task	4.2(0.8)	4.1(1.0)	4.3(0.8)	3.8(1.3)	ns
Response to Failure	3.5(1.0)	3.6(1.0)	3.7(0.9)	3.7(0.7)	ns
General Self Confidence	3.8(0.9)	3.7(0.9)	3.7(0.7)	3.7(0.8)	ns
Combined Self Confidence	3.8(0.8)	3.8(0.9)	3.9(0.7)	3.8(0.8)	ns

See note [a] on Table B-1

Table B-12

Tester-rated Test Strategy and Self-control by Grade and Program[a]

	HD	AFD	RFD	UFD	sig.
Junior Kindergarten					
N	27	42			
Test Strategy	2.4(.6)	2.4(.6)			ns
Self-control	1.3(.4)	1.5(.3)			ns
Senior Kindergarten					
N	34	40	45	25	
Test Strategy	2.9(.2)	2.8(.4)	2.9(.3)	2.7(.4)	.07
Self-control	1.2(.2)	1.3(.4)	1.3(.4)	1.4(.4)	ns
Grade 1					
N	27	42			
Test Strategy	2.7(.3)	2.7(.4)			ns
Self-control	1.2(.4)	1.1(.2)			ns
Grade 2					
N	34	40	44	25	
Test Strategy	2.9(.2)	2.8(.3)	2.6(.4)	2.6(.3)	.001
Self-control	1.1(.2)	1.1(.2)	1.1(.2)	1.1(.2)	ns

a. See note a on Table B-1.

Table B-13

Self-Direction by Grade and Program[a]

(standard deviations in parentheses)

	HD	AFD	RFD	UFD	sig.
Grade 1					
N	27	36			
Free Time	3.7(1.2)	3.8(1.2)			ns
Classroom Management	4.2(0.9)	4.2(0.9)			ns
Academic Routines	3.7(0.9)	3.9(1.0)			ns
Teacher-set Tasks	3.7(0.9)	4.0(1.0)			ns
Combined Self-direction	3.9(0.7)	4.0(0.8)			
Grade 2					
N	34	40	42	25	
Free Time	3.8(1.0)	4.0(1.2)	3.8(1.1)	3.6(1.2)	ns
Classroom Management	3.9(0.8)	4.1(1.0)	4.0(1.1)	3.9(1.3)	ns
Academic Routines	3.9(1.0)	3.8(1.0)	3.7(1.0)	4.0(1.2)	ns
Teacher-set Tasks	4.1(0.8)	4.1(1.0)	4.3(0.8)	3.9(1.3)	ns
Combined Self-direction	3.8(0.8)	3.9(0.9)	3/9(0.9)	3.8(1.1)	ns

a. See note a on Table B-1.

Appendix C. Supplementary Table for Chapter Eight

Table C-1

Grade 1 and 2 Social, Temperamental, and Self-Process Variables by Kindergarten Language and Academic Skills

1980 Variables	Pennies	Func. Lang.	Math Skill	Number Recog.	Letter Recog.
Social Skills					
Peer					
Gr. 1	.12	.22	.22	.31	.26
Gr. 2	.23	.18	.24	.24	.22
Adult					
Gr. 1	.04	.07	-.02	.20	.05
Gr. 2	.20	.20	.16	.08	.09
Adult-led Group					
Gr. 1	.30	.15	.26	.31	.25
Gr. 2	.28	.21	.39	.31	.31
Empathy					
Gr. 1	.08	.03	.13	.31	.18
Gr. 2	.28	.24	.31	.19	.27
Temperament					
Approach/Withdrawal					
Gr. 1	.32	.25	.29	.20	.27
Gr. 2	.29	.21	.28	.22	.21
Adaptability					
Gr. 1	.18	.25	.37	.37	.43
Gr. 2	.10	.13	.40	.29	.40
Persistence					
Gr. 1	-.06	-.11	.20	.17	.12
Gr. 2	.10	.21	.40	.25	.44
Distractibility					
Gr. 1	-.12	-.00	-.24	-.14	-.16
Gr. 2	-.06	-.15	-.26	-.25	-.32

Table C-1 (continued)

1980 Variables	Pennies	Func. Lang.	Math Skill	Number Recog.	Letter Recog.
Activity					
Gr. 1	-.05	-.08	-.27	-.16	-.13
Gr. 2	-.07	-.13	-.29	-.22	-.42
Positive Mood					
Gr. 1	.11	.09	.20	.14	.19
Gr. 2	.20	.17	.35	.25	.32
Negative Mood					
Gr. 1	-.10	-.10	-.20	.05	.07
Gr. 2	-.09	-.04	-.23	-.16	-.37
Threshold					
Gr. 1	.11	.24	.03	.14	.04
Gr. 2	.02	-.04	-.03	.13	.17
Intensity					
Gr. 1	.12	.04	.04	.03	.07
Gr. 2	.07	.09	-.11	-.24	.03
Self-processes Self-confidence					
Gr. 1	.18	.23	.28	.32	.37
Gr. 2	.20	.23	.29	.32	.38
Teacher-rated Self-Direction					
Gr. 1	.11	.12	.40	.23	.40
Gr. 2	.06	.18	.39	.34	.34
Tester-rated Self-Direction					
Gr. 1	.14	-.03	.07	.05	.00
Gr. 2	.32	.23	.30	.11	.43